

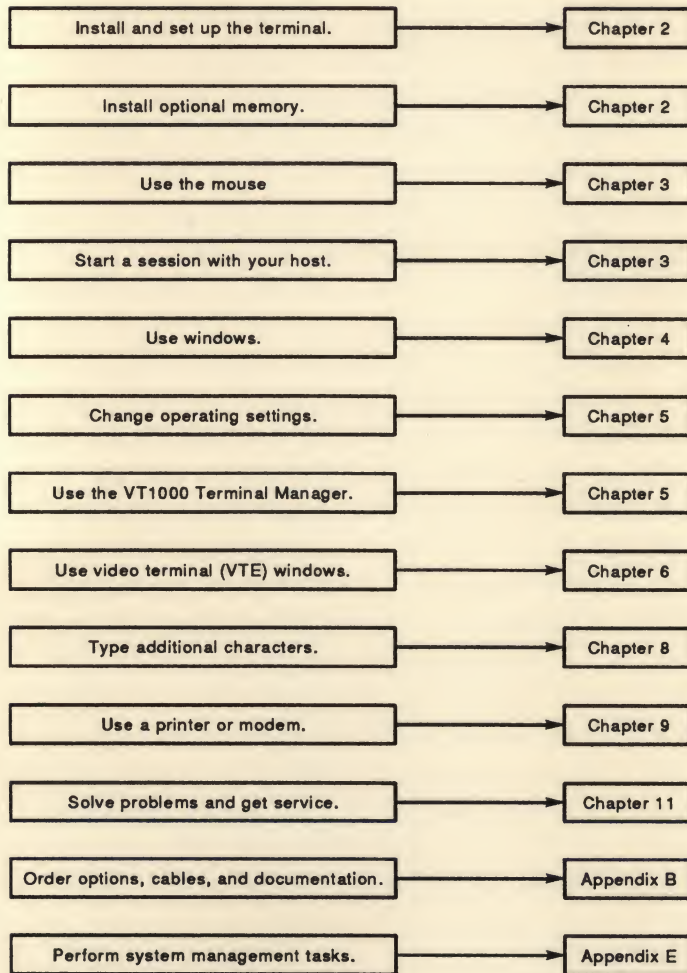
VT1000

digital

Installing and Using
The VT1000 Video Terminal

Order Number: EK-V1000-UG-001

USER'S INFORMATION MAP



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Installing and Using The VT1000 Video Terminal

Order Number EK-V1000-UG-001

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About This Guide

This guide is designed to help you install, operate, and maintain your VT1000 video terminal. The guide provides information on how to open X window or video terminal sessions on a VMS, ULTRIX, or UNIX system.

Who Should Use This Guide

This guide is for the installer and general user of the VT1000 video terminal. The guide also provides programmers with a summary of control functions they can use when writing applications for video terminal (VTE) windows.

Organization

This guide contains the following chapters and appendices:

- Chapter 1, "A Look at the Terminal," provides an overview of the VT1000 terminal and its features.
- Chapter 2, "Installing Your Terminal," describes how to install your terminal and connect it to a host computer system. The chapter also describes how to install optional RAM and ROM boards.
- Chapter 3, "Getting Started," describes how to start a session on your host system. You can use the terminal with VMS, ULTRIX, or UNIX systems. The chapter also shows how to use the mouse.
- Chapter 4, "Using Windows," describes how to manipulate windows, choose menu items, and edit text.
- Chapter 5, "Using the VT1000 Terminal Manager," describes how to use the VT1000 Terminal Manager window. You use this window to open sessions, print screen displays, and customize the VT1000 terminal's operating settings for your computing environment.

- Chapter 6, "Using Video Terminal Windows," describes how to use video terminal (VTE) windows. VTE windows let you emulate Digital's VT series of text terminals.
- Chapter 7, "The Keyboard," describes the function of the keyboard's keys, bells, and indicator lights.
- Chapter 8, "Typing Additional Characters," describes how to enter characters that do not appear as standard characters on your keyboard (for example, accented letters).
- Chapter 9, "Printers and Modems," describes how to use a printer or modem with the terminal.
- Chapter 10, "VT1000 VTE Programming Summary," provides programmers with a quick-reference summary of programming control functions for video terminal (VTE) window applications. The chapter also lists programming differences between the VT1000 and Digital's VT320 video terminal.
- Chapter 11, "Solving Problems and Getting Service," describes how to solve typical operating problems and directs you where to get more help.
- Appendix A, "Specifications," lists VT1000 specifications.
- Appendix B, "Options and Documentation," lists options, related documentation, and ordering information.
- Appendix C, "Communication," provides technical information on communication with a host computer system. The appendix describes network protocols for LAT and TCP/IP connections, as well as serial communication.
- Appendix D, "Running a Remote X Window Session on a VMS System," describes how to run a remote X window session on a VMS system.
- Appendix E, "System Management Tasks," describes tasks for system managers to perform before installing and running the terminal.
- Appendix F, "Keyboard Models," shows the different models of the VT1000 keyboard, for different language dialects.
- The glossary defines new terms introduced in the text.

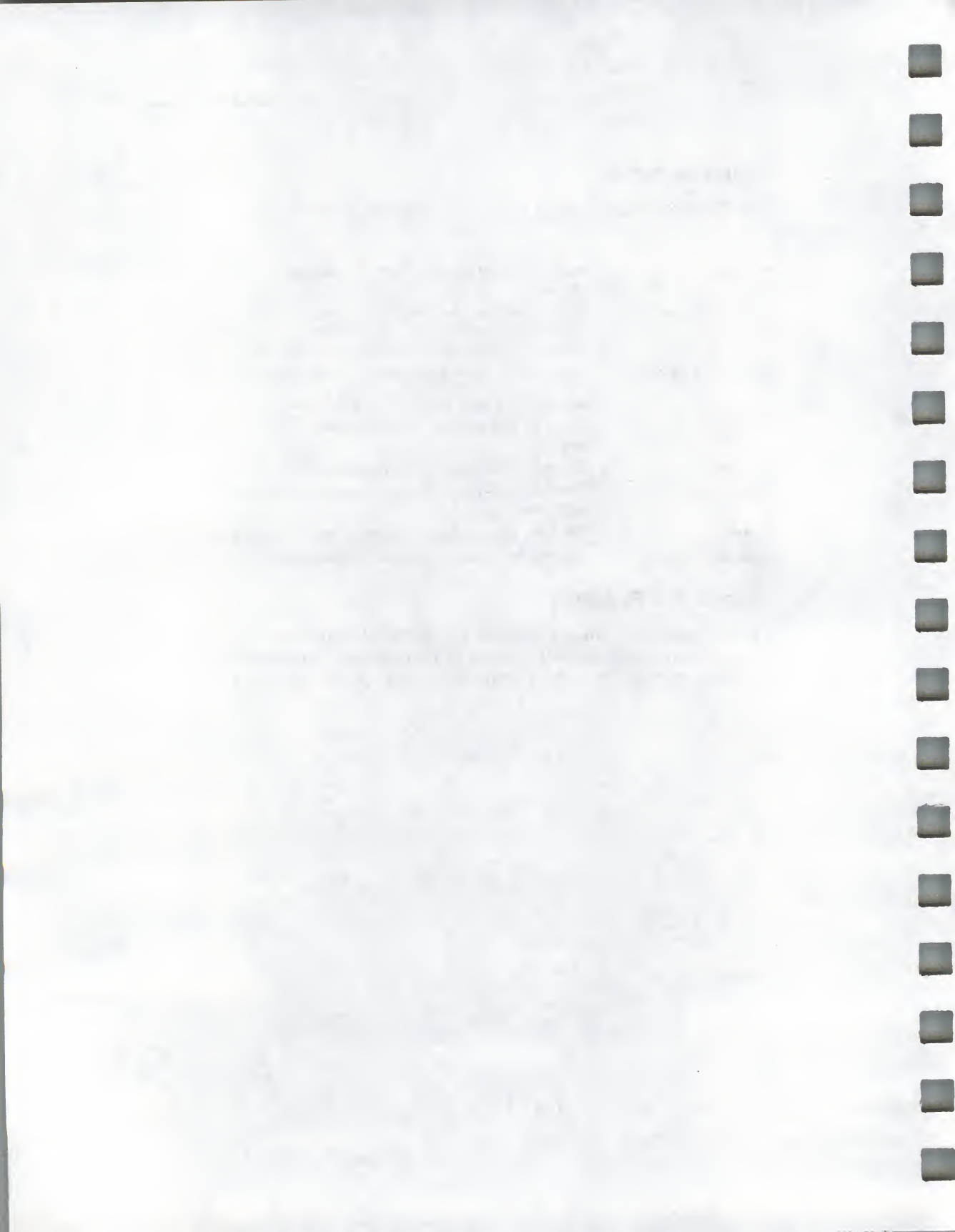
Conventions

The following conventions are used in this manual:

mouse	Refers to any pointing device, such as a mouse, a puck, or a stylus.
MB1, MB2, and MB3	MB1 indicates the left mouse button. MB2 indicates the middle mouse button. MB3 indicates the right mouse button. (The buttons can be redefined by the user.)
Keyboard keys	Keys or switches that are labeled appear in a <u>box</u> . Example: Press the <u>Return</u> key. For <u>Ctrl</u> key sequences, hold down <u>Ctrl</u> and press the other key.
Warnings	Provide information to prevent personal injury.
Cautions	Provide information to prevent damage to equipment or software.
Notes	Provide general information about the current topic.
Glossary entries	Appear in <i>italics</i> when first used in text.

Note to the Reader

The screens and windows shown in this guide represent the latest information available at the time of publication. Some screens and windows may not exactly match those that appear on your terminal.



1

A Look at the Terminal

This chapter introduces you to the VT1000 video display terminal. The chapter provides an overview of the terminal and its basic operating features. The chapter also tells you where to look in this manual for more information about each feature.

The VT1000 lets you run X window applications on your computer system, including Digital's DECwindows software. The VT1000 also provides video terminal (VTE) windows that are compatible with VT series text terminals.

You can use the VT1000 with one or more computer systems. The VT1000 can work with computers that use the VMS, UNIX, or ULTRIX operating systems. You have several options for connecting your terminal to a computer.

You can use a mouse or keyboard to send information to the host system. You can print data displayed on the screen by connecting a printer to the VT1000 system box or by using printers connected to your host system.

VT1000 Components

The VT1000 terminal has four main components: a system box, monitor, keyboard, and mouse.

2 A Look at the Terminal



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System Box

The VT1000 system box contains the terminal's logic and memory boards. It also provides the connectors for power, system communication, and other devices. A cover panel attaches to the rear of the system box to conceal the connectors and cables. The system box is 368 mm deep \times 394 mm wide \times 57 mm high (14.5 inches \times 15.5 inches \times 2.25 inches).

Monitor

The VT1000 comes with one of the following monochrome monitors:

- VR150 (381 mm/15 inch)
- VR262 (482 mm/19 inch)
- VRE01 (482 mm/19 inch)

When connected to a host system, the monitor displays information you send to the host system and information the host system sends to you. For more information about your monitor, see your monitor's installation guide.

Screen Saver Feature

The VT1000 has a screen saver feature to extend the life of its monitor's screen. The screen automatically goes blank if the VT1000 is inactive for approximately 10 minutes (no keyboard activity or input from the host system). You do not lose the data that was displayed. To reactivate the screen, press any key. You can disable the screen saver or vary the time before the screen goes blank, from 1 to 60 minutes. See "Changing Your Window Settings" in Chapter 5.

Keyboard

The LK401 keyboard has four groups of keys and two indicator lights. the keyboard cable connects to the system box. Chapter 7 describes the keyboard.

Mouse

The mouse is a three-button pointing device. You use the mouse to make selections from screen menus, enter data for graphics, or select points on the screen. The mouse connects to the system box. Chapter 3 describes how to use the mouse.

X Window Sessions and Video Terminal Sessions

You can use two types of sessions on your host computers:

X Window Session

To use an X window session, you log in to a host and use that host's X window software. In an X window session, you can use all the applications and utilities provided in the X Window System. For more information, see the *VMS DECwindows User's Guide*.

Video Terminal Session

You can use your VT1000 as a video text terminal. The VT1000 has a video terminal (VTE) window that lets you log in to a host as you would on a conventional video terminal. The VT1000's VTE window offers the features of Digital's VT320 terminal with some enhancements.

You can open one X window session and several VTE sessions at the same time. Each session appears in a separate window.

X Window System and DECwindows

The X Window System is a graphically oriented user interface that lets you display one or more windows on the screen. Each window can represent a different *software application* running on its own host system. For example, you could run a word processing application in one window and a spreadsheet application in another window. With windows, you can perform many tasks in an easy and efficient manner.

The X Window System was designed at the Massachusetts Institute of Technology. Digital's DECwindows software is based on and fully compatible with the X Window System.

System Requirements

You can use your VT1000 with the VMS, ULTRIX, or UNIX operating systems.

VMS Systems: LAT Protocol

The VMS operating system is one of Digital's operating systems. To make network connections to a VMS host system, use the local area transport (LAT) protocol. LAT is a communications protocol for connecting to VMS host systems.

To open a video terminal (VTE) session: You can use any version of the VMS operating system.

To open an X window session: You must have VMS version 5.3-1 or later installed on your system.

UNIX and ULTRIX Systems: TCP/IP TELNET Protocol

The UNIX operating system was created by AT&T and is used throughout the computer industry. The ULTRIX operating system created by Digital is based on the UNIX operating system. To make network connections to a UNIX or ULTRIX host, you normally use the transmission control program/Internet protocol (TCP/IP) networking software. TCP/IP is the preferred communication protocol for UNIX-based systems.

The VT1000 uses the TCP/IP TELNET protocol to make network connections to UNIX-based host systems. TELNET is the TCP/IP protocol that lets terminals connect to host systems in a wide-area network.

To open a video terminal session: You can use any version of UNIX or ULTRIX.

To open an X window session: You must have ULTRIX version 3.1 or later installed on your system. You can use any version of UNIX to open an X window session, as long as the X Window System is installed on that host.

How the VT1000 Works

You use the keyboard and mouse to interact with applications on your system. You send data to the application by typing on the keyboard or selecting window options with the mouse. Data sent by the application appears as text or graphics on the screen. You can print text or graphics from the VT1000.

You can use a variety of host software applications on the VT1000. For example, your host may have applications for word processing, data entry, programming, or business graphics. Most applications involve interactive processing. This means the VT1000 immediately sends the information you enter from the mouse or keyboard to the host.

Applications use programming functions to perform many operations. The VT1000 can work with standard American National Standards Institute (ANSI) functions. See Chapter 10.

You can use the VT1000 with one or more computer systems. You have several options for connecting your terminal to a computer. You can connect the terminal directly to a computer through one of two serial ports, or you can connect the terminal indirectly through an Ethernet network using the ThinWire port.

The computer system you connect to is called the *host*. You can connect several VT1000 terminals to a single host or connect one VT1000 terminal to several hosts.

VT1000 Terminal Highlights

The VT1000 terminal is a four-piece desktop unit that provides many of the features of a workstation. The VT1000 provides you with the following features:

- A workstation-style display, resolution, keyboard, and mouse
- An X Window System desktop server for efficient interaction with DECwindows and X window applications
- A local window manager that lets you move and resize windows
- A local terminal manager that lets you create, manage, and delete connections to hosts

- A local video terminal (VTE) window that lets you use the VT1000 as a conventional video terminal
- Access to VMS, ULTRIX, and UNIX operating system software at the same time
- Serial interfaces for a keyboard and a mouse or tablet
- Two serial lines with DEC-423 connectors for serial host communication and printer support, like a traditional terminal
- A ThinWire Ethernet port to connect to an Ethernet network
- An optional RAM board that provides upto 3 more megabytes of memory storage

The RAM board is user installable

Customizing Your Terminal

The VT1000 has a terminal manager window with a Customize menu that lets you check and control the settings of the terminal's operating features. The Customize menu lets you set up your terminal to match your host system's computing environment. You can

- Change individual feature settings.
- Recall factory-default settings or your own stored settings from memory.
- Make temporary changes for the current session or store new settings for all future sessions.

When you select an item from the Customize menu, a dialog box appears. Each dialog box shows the current settings of the selected feature. You can then record your settings or dismiss the dialog box without making changes. Chapter 5 describes how to customize your system environment.

The VT1000 stores many of its feature settings in nonvolatile memory. Nonvolatile memory retains settings even when power is shut off. The terminal always retains factory-default settings, as well as the settings you save.

Compatibility with VT Series Terminals

The VT1000 can operate as a video text terminal when you want to log in to a host system as you would with a conventional video terminal. You can use the VT1000 as one of Digital's VT300 series, VT200 series, or VT100 series text terminals. Chapter 6 describes the video terminal (VTE) window and how to use it.

Character Sets

The video terminal (VTE) window provides different character sets to match your computer system or to meet your software application requirements. You can select from:

- Two 8-bit multinational character sets, using the Customize General dialog box
- Several 7-bit national replacement character sets (NRCs), using the Customize VTE 7-Bit NRCS dialog box

See Chapter 6.

The VT1000 terminal has the following built-in character sets:

- ASCII (American Standard Code for Information Interchange)
- DEC Supplemental Graphic
- ISO Latin Alphabet Number 1 (ISO Latin-1)
- DEC Special Graphic (line drawing)
- DEC Technical
- National replacement character (NRC) sets

The VT1000 terminal also has two control character sets.

- ASCII C0 control set
- 8-bit ASCII C1 control set

Normally, control characters perform a programming action and are not displayed.

Multinational Character Sets

DEC Multinational Character Set

The VT1000 terminal is initially set to use the DEC Multinational character set. This set is a combination of the standard ASCII set and the DEC Supplemental Graphic set. The DEC Multinational character set contains the characters for the English language, plus many characters used in Western European languages. Use this set with applications that require compatibility with VT300 series terminals.

ISO Latin Alphabet No. 1 Character Set

You can also select the ISO Latin Alphabet No. 1 (ISO Latin-1) character set of the International Standards Organization. ISO Latin-1 is the new industry-standard set. It is similar to the DEC Multinational character set, with a few different symbols and characters. The ISO Latin-1 set also includes the standard ASCII character set.

Digital recommends using the ISO Latin-1 set for most applications. However, if you use the DEC Multinational set, many applications will be unaffected by the subtle differences between the two character sets.

National Replacement Character Sets

The VT1000 supports several national replacement character (NRC) sets for 7-bit applications. Each NRC set is for a particular Western European language or dialect. NRC sets are similar to the ASCII set, but replace a few ASCII characters with characters used in that language or dialect. You can only use one NRC set at a time.

If you select 7-bit NRCS characters, you cannot use the 8-bit multinational character sets. However, if you select 8-bit multinational characters you can still use an NRC set. In that case, the NRC set replaces the ASCII set.

Programming the VT1000 Terminal

The *VT320 Programmer Reference Manual* explains the control functions used to access the terminal's video terminal (VTE) window features. Programmers use these functions in their applications.

Chapter 10 of this user guide is a summary of the control functions and commands described in the *VT320 Programmer Reference Manual*.

Installing Your VT1000 Video Terminal

2

Installing Your Terminal

This chapter provides step-by-step instructions on how to:

- Prepare for installation.
- Unpack, inspect, and check the terminal's components.
- Connect your terminal to a monitor, mouse, and keyboard.
- Connect your terminal to a network.
- Turn on your terminal.
- Connect an optional printer, modem, or tablet.
- Install an optional memory board.

Carefully read all installation instructions before you turn on the power.

Site Preparation

Before you install your VT1000 video terminal, make sure your computer system has the necessary network hardware and system software to support the terminal. See your system manager to make sure these requirements are met.

For System Managers

System managers need to prepare the system for use with the VT1000 video terminal. Appendix E describes the required tasks.

Network Hardware Support

The VT1000 video terminal requires one of the following physical connections to connect to a host computer system:

ThinWire connector	Lets the VT1000 operate with X window applications and multiple text terminal sessions, using either the LAT or TCP/IP network protocol. You must use the ThinWire connector to operate with X window or DECwindows software.
Serial line	Lets the VT1000 connect to a single host or terminal server as a traditional text terminal.

System Software Support

The following table summarizes the system resources needed to open X window sessions or video terminal (VTE) sessions:

Operation	Operating System	Communication Protocol
Video terminal session	VMS Version 4.0	LAT
	UNIX (any version)	TELNET (TCP/IP)
	ULTRIX (any version)	TELNET (TCP/IP)
X window session	VMS Version 5.3-1	LAT
	UNIX (any version) and a font tape	TELNET (TCP/IP)
	ULTRIX-32 Version 3.1 and U/WS Version 2.1	TELNET (TCP/IP)

Selecting a Location

Use the following guidelines to select a good location for your terminal:

- Select a surface area that is large enough to hold your system box, monitor, keyboard, and mouse.
- Place your monitor so that the top line of the monitor display is at eye level.
- To avoid screen glare, select a place where bright light will not reflect off the monitor.
- Do not block the air vents on the sides of the system box or place the system box on its side. Blocking the air vents can cause the system to overheat.
- Keep the area clean. Do not place food or liquid on or near your terminal.
- Keep the temperature between 10° and 40° C (50° and 104° F), and the relative humidity between 10% and 95%.
- Keep the air well circulated, to prevent excess heat and dust from accumulating.
- Keep your terminal away from heaters, photocopiers, direct sunlight, and abrasive particles.

Installation

Unpack and check the contents of each carton.

1. Look for external damage on the shipping cartons, such as dents, holes or crushed corners.
2. Unpack the shipping cartons.

WARNING

If necessary, use two people to lift or move the monitor out of the shipping carton. The approximate weight of the monitor is

- **VR150 monitor: 16.34 kg (36 lb)**
 - **VR262 monitor: 18 kg (40 lb)**
 - **VRE01 monitor: 7.7 kg (15 lb)**
3. Make sure you have all the items shown in the following figure. Carefully inspect the components for shipping damage. If you have missing or damaged items, contact your sales representative and delivery agent.

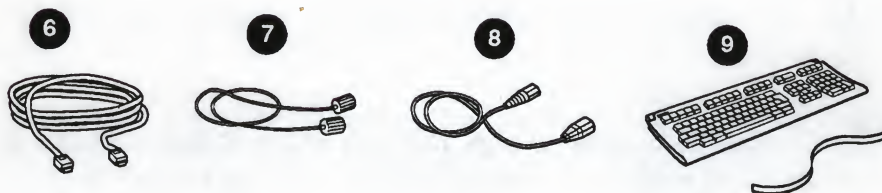
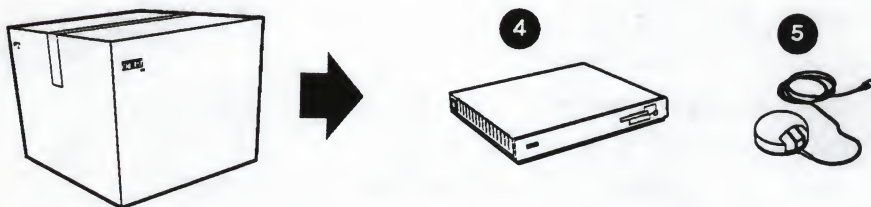
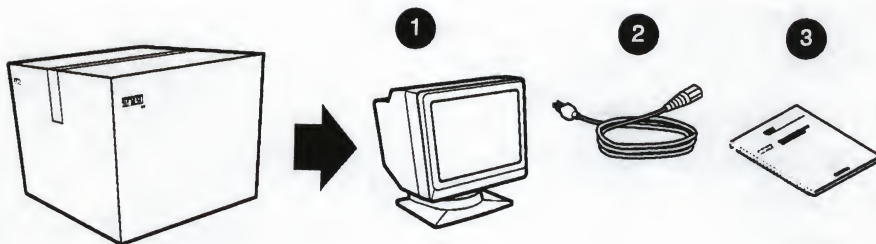
CAUTION

If you received optional memory boards, do not remove them from the antistatic bag at this time. Static electricity can damage memory boards.

4. Save the empty shipping cartons and packing material for repacking, in case you move or relocate your terminal.

Install any optional memory first.

If you ordered additional memory for your terminal, go to the "Installing Memory" section at the end of this chapter. You should install memory boards in the system box before proceeding.



VT1000 Parts Checklist

- ① Monitor: VR150, VR262, or VRE01
- ② System box power cord
- ③ Monitor installation guide
- ④ System box
- ⑤ Mouse
- ⑥ DEC-423 communication cable
- ⑦ Monitor cable

The monitor cable for the VR262 and VRE01 monitors has a grounding adapter attached.

- ⑧ Monitor power cord
- ⑨ Keyboard and legend strip
- ⑩ Ethernet cable and connector
- ⑪ EIA adapter (6-pin to 25-pin)
- ⑫ *Installing and Using the VT1000 Video Terminal*
- ⑬ Rear dress panel

Options (See "Installing Memory")

- Memory controller board (comes with one SIMM card preinstalled)
SIMM card(s)

NOTE

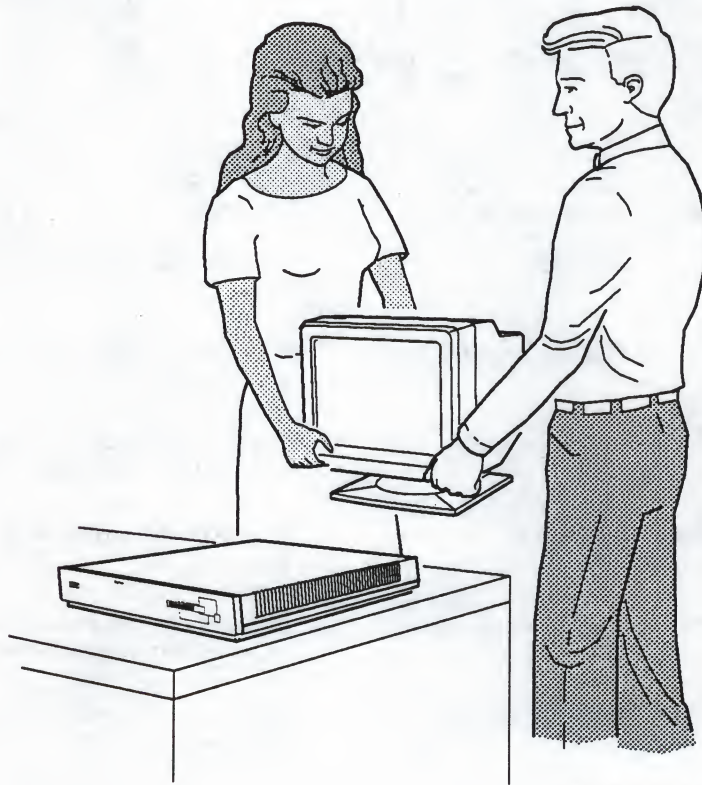
If you receive three power cords (a short one and two long ones), the second long power cord is not needed for this installation.

Place the system box on a level surface. Place the monitor on top of the system box.

Leave enough room at the rear of the system box and monitor for connecting cables.

WARNING

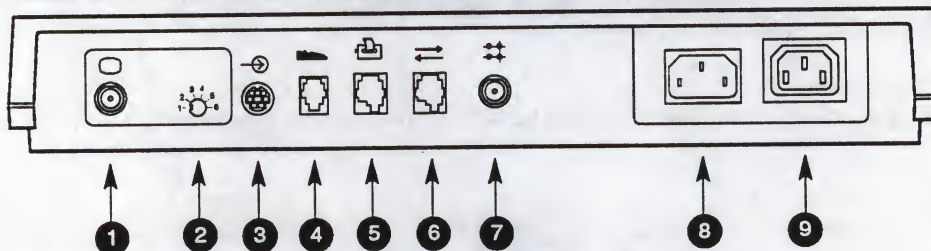
If necessary, use two people to lift or move the monitor.










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Identify the connectors and switches on the system box.

Look at the rear of the system box to become familiar with the ports and connectors. Some connectors have an icon figure to identify them.



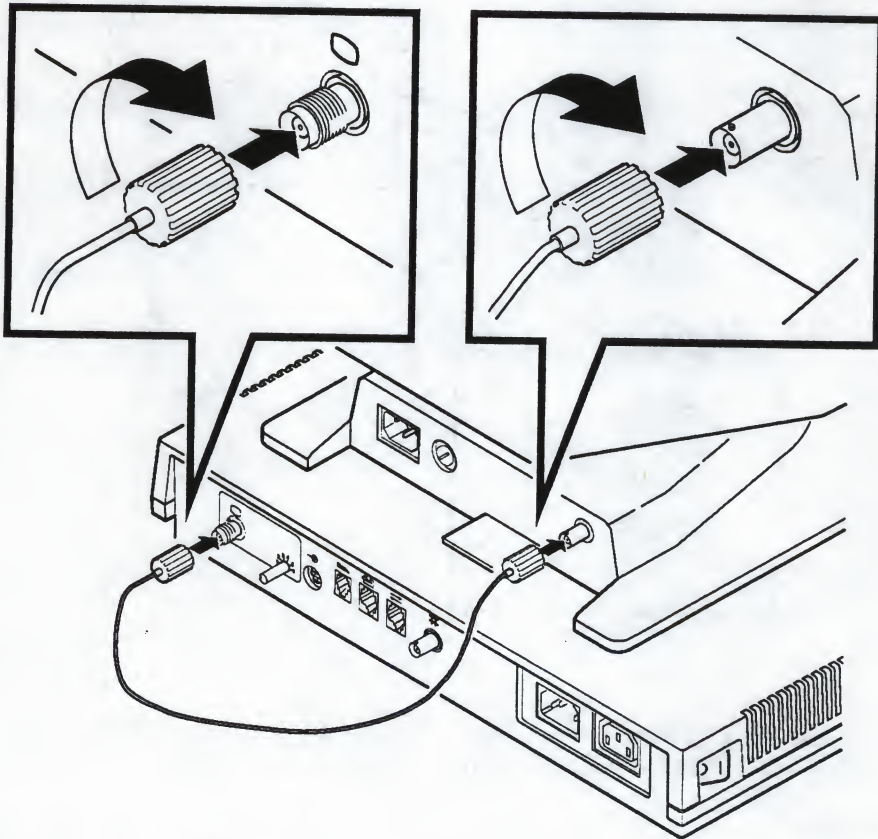
GSF_0824_89.DG

	Icon	Connector or Switch	Function
1		Monitor	Connects the monitor to the system box.
2		Monitor selection switch	Sets the terminal to work with your monitor.
3		Mouse/pointing device	Connects a mouse or graphics tablet to the terminal.
4		Keyboard	Connects the keyboard to the terminal.
5		Serial printer port	Connects the terminal to a printer or secondary host computer.
6		Serial host port	Connects the terminal to a primary host computer, or terminal server.
7		ThinWire Ethernet	Connects the terminal to a local area network.
8		System box ac power	Connects the power cord to the terminal.
9		Monitor ac power	Connects the monitor's power cord to the system box for power.

Connect the monitor to the system box.

The monitor cable has a TNC connector on one end and a BNC connector on the other end. The TNC connector is the threaded end.

1. Screw the threaded end of the monitor cable onto the monitor connector on the rear of the system box. Turn the cable connector three full revolutions to the right, until it locks in place.
2. Push the other end of the monitor cable onto the monitor's BNC connector. Then turn the cable connector to the right until it locks in place.

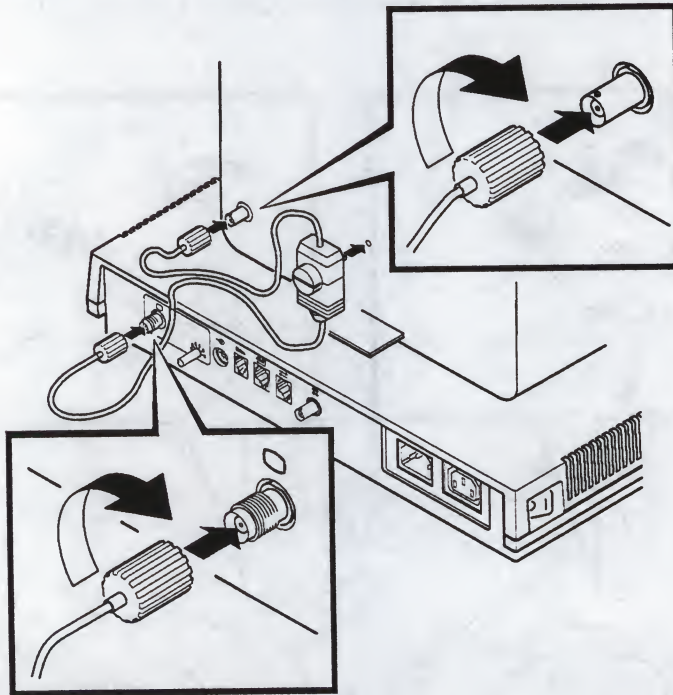


**Connect the monitor's cable holder
(VR262 and VRE01 monitors only).**

NOTE

If you have a VR150 monitor, skip this step and go to the next page.

The monitor cable for the VR262 (shown) and VRE01 monitors comes with a holding fixture that screws into the rear of the monitor.



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Place the holding fixture screw into the hole on the rear of the monitor and turn the thumbwheel to the right until it locks in place.

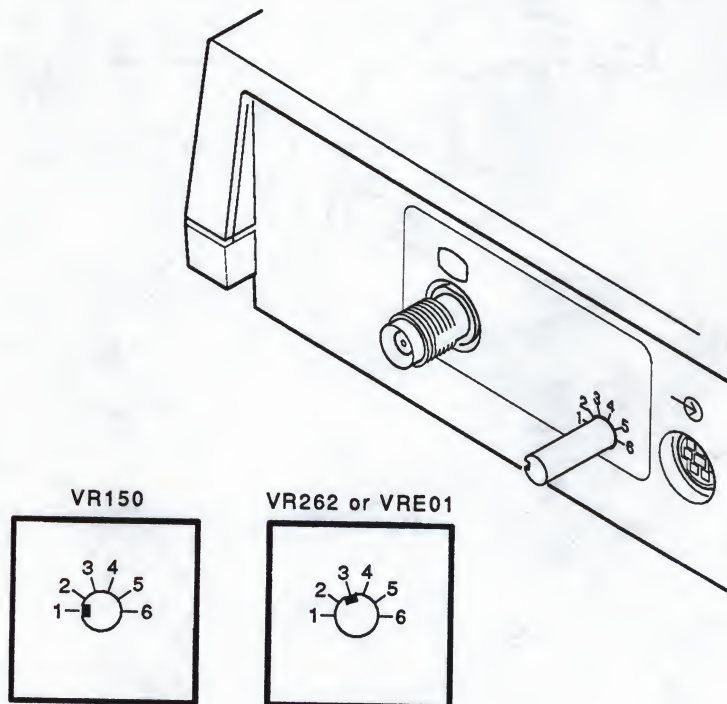
CAUTION

Failure to secure the holding fixture to the metal bracket may strain the cable and may also cause electromagnetic interference in excess of FCC guidelines.

Set the monitor selection switch.

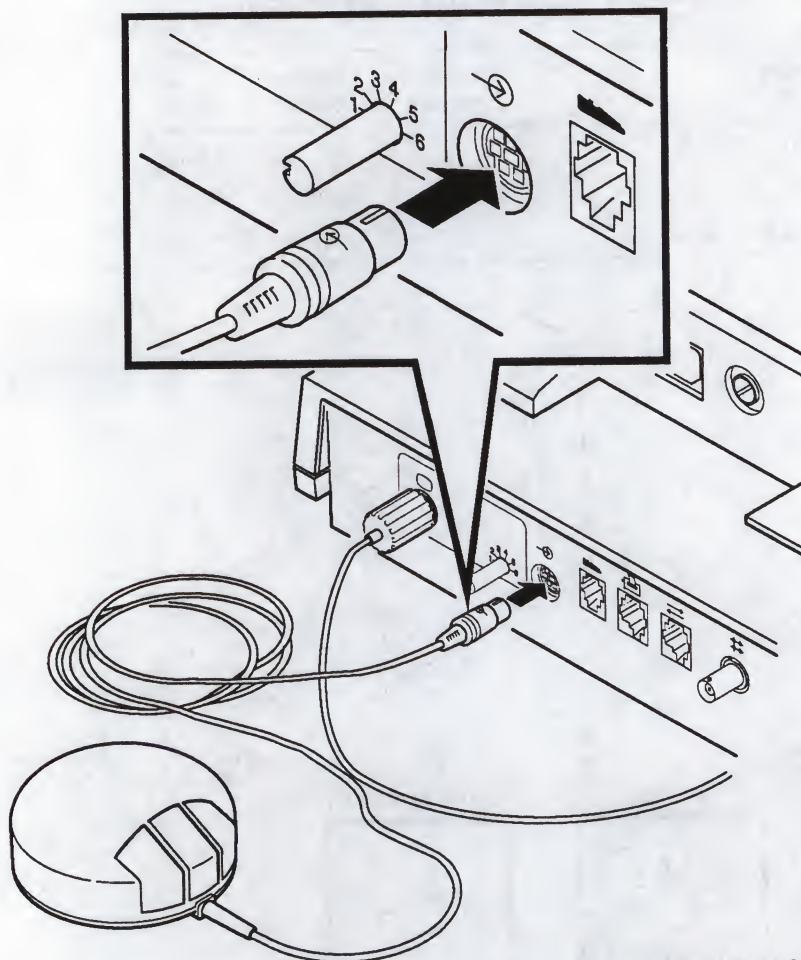
You must set the monitor selection switch on the rear of the system box to match the model of your monitor. To find the model number, check the labels on the rear of your monitor. Then find the correct switch setting for your model. Set the switch to the correct position.

Monitor Model	Switch Position	Screen Size
VR150 CRT	1	381 mm (15 inch)
VR262 CRT	3	482 mm (19 inch)
VRE01 flat panel	3	482 mm (19 inch)



Connect the mouse to the system box.

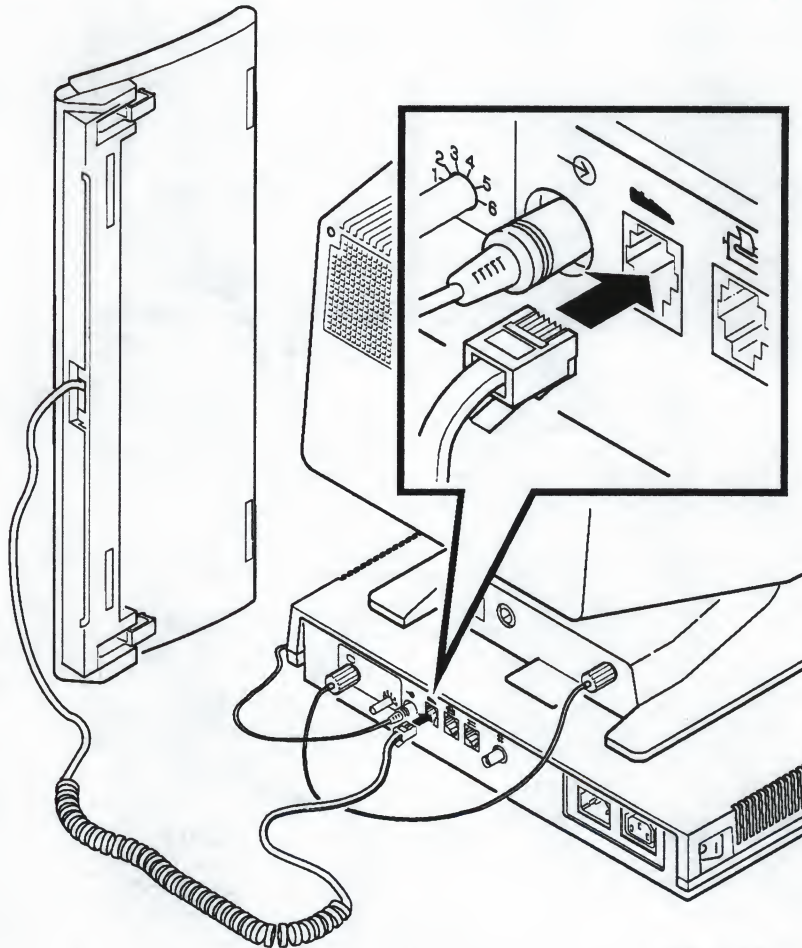
Connect the mouse cable to the mouse connector on the rear of the system box. Align the circled arrows and push the connector straight in.



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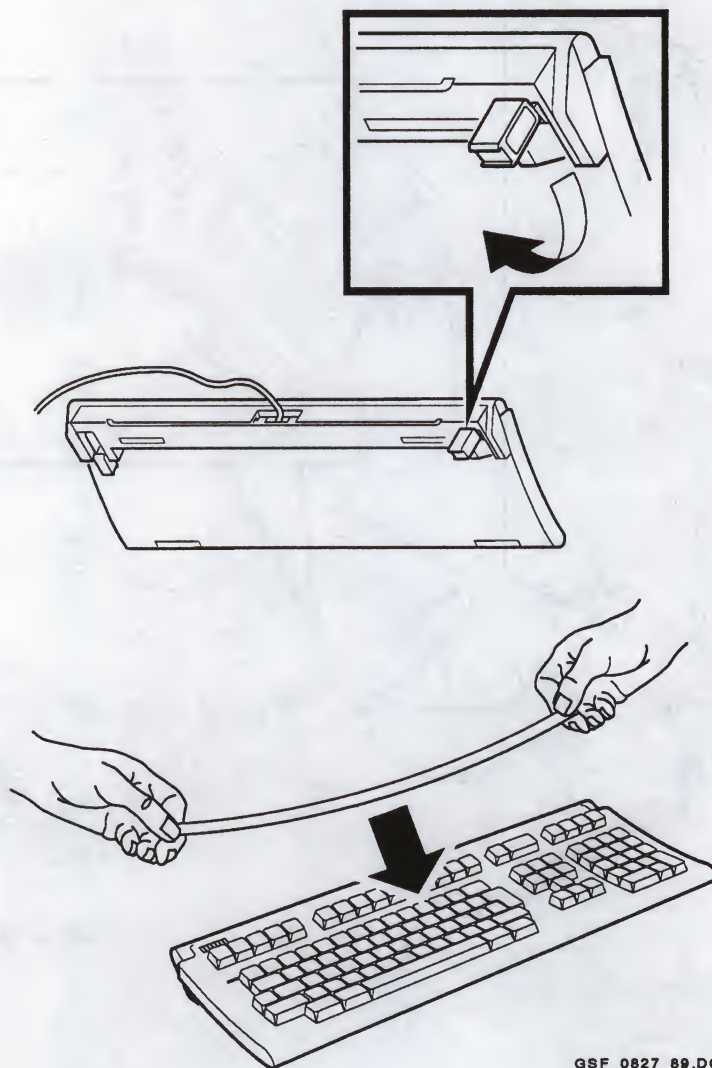
Connect the keyboard to the system box.

The keyboard cable is already connected to the rear of the keyboard. If you want the cable routed to one side, press it into one of the grooves on the bottom of the keyboard.



Lower the keyboard's legs and install the legend strip.

Turn the keyboard upside down and lower the two legs on the bottom of the keyboard. Then turn the keyboard over, peel off the legend strip's backing, and place the legend strip between the top row of keys and the main keyboard.



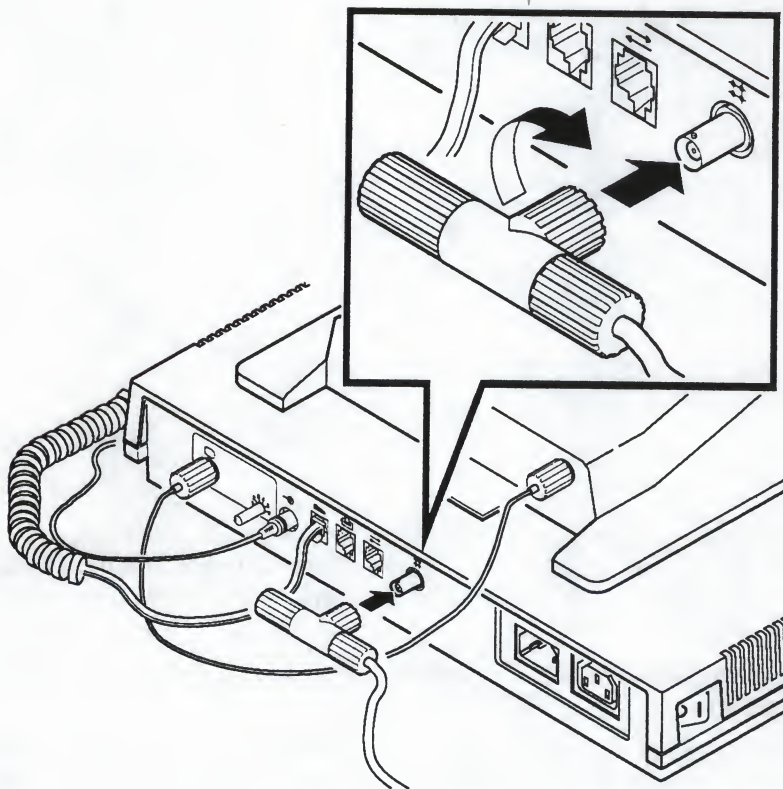
Connect the ThinWire Ethernet cable.

1. Push the cable's T-connector onto the ThinWire Ethernet connector at the rear of the system box. Then turn the T-connector to the right until it locks in place.

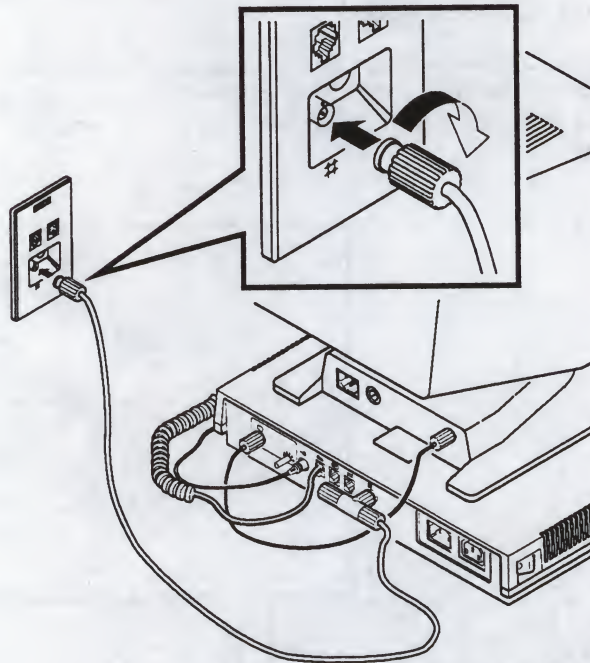
If you want to connect another terminal to the ThinWire Ethernet cable, unscrew the terminator from the T-connector and add another section of cable.

If you need to disconnect the Ethernet T-connector from the rear of the system box, turn the T-connector to the left until it comes off. Do not disconnect any cable sections or the terminator from the T-connector.

turn system off!



2. Connect the other end of the cable to the ThinWire Ethernet connector in your office or to the T-connector of the next terminal in the segment. Push the cable connector onto the ThinWire Ethernet connector, then turn the cable to the right until the connector locks in place.



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You may have a DECconnect faceplate in your office. A faceplate is a wall receptacle that provides a single network connection for your terminal. There are two types of DECconnect faceplates. The two types look the same, but work differently.

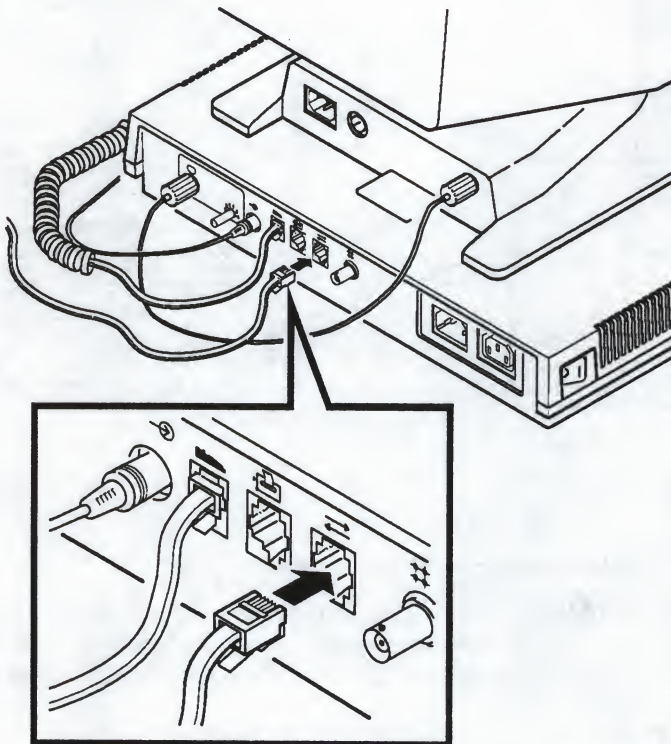
- One type lets you connect several terminals in a segment to the faceplate.
- The other type lets you connect a single terminal to the faceplate. The faceplates are already connected to a segment of ThinWire cable.

You can connect your VT1000 video terminal to either type of DECconnect faceplate. Your system manager will know which type you have in your office.

Optional: Connect the serial communication cable to the system box.

You can also connect your terminal to a host system by using the serial communication connector on the rear of the system box. This connection lets you operate your terminal as a VT320 video terminal, but you cannot run DECwindows over this connection.

You can use the ThinWire Ethernet and serial communication connections at the same time.



GSF_0833_89.DG

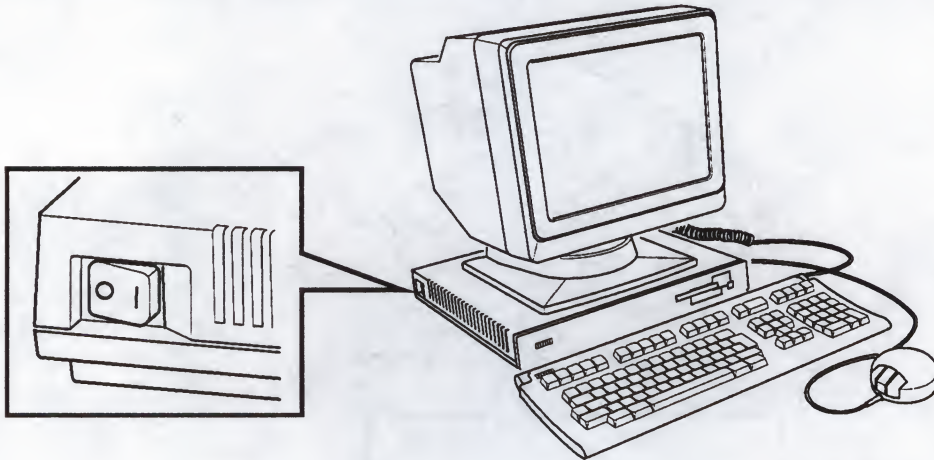
Baud Rate For serial communication, the VT1000 line speed is initially set to a baud rate of 9600. This setting works with most Digital systems. The baud rate setting must match the baud rate of your host system. You can change the setting from the Customize Communications dialog box. See "Changing Your Host Port or Printer Port Settings" in Chapter 5.

Connect the two power cords.

Your terminal comes with two power cords. The short power cord connects the monitor to the system box. The long power cord connects the system box to an electrical wall outlet. The long power cord provides an electrical ground for your system box and monitor.

To connect the power cords:

1. Make sure the system box's ☐ power switch is off (O).



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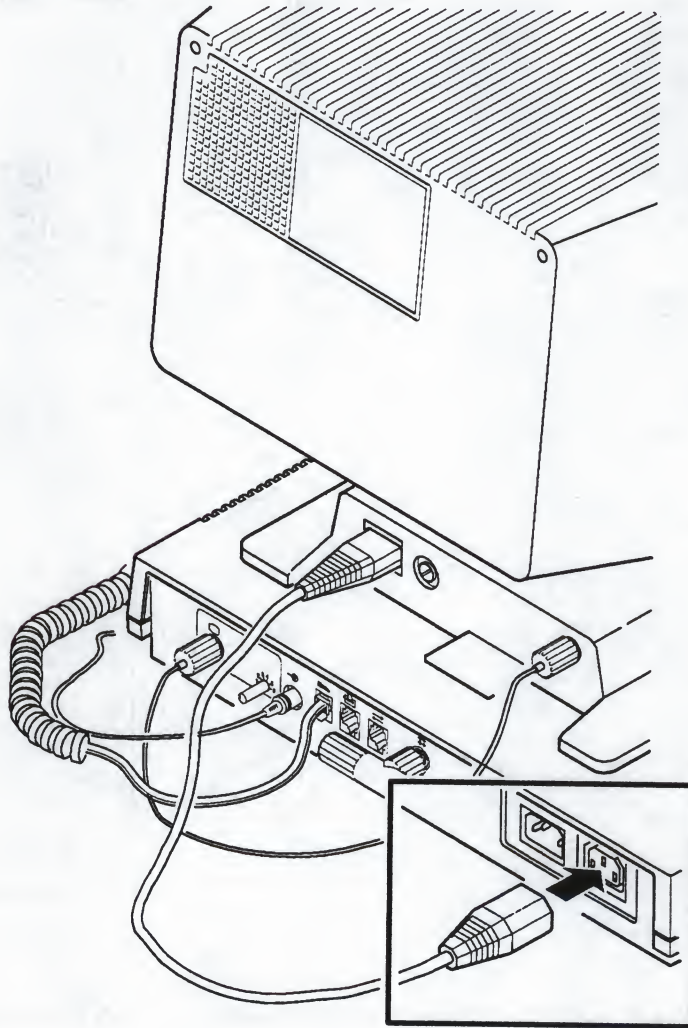
2. Make sure the monitor's ☐ power switch is off (O).
3. Check the 110/220 voltage switch setting on the rear of your monitor. Make make sure the setting matches your voltage source. If necessary, change the setting to match the available voltage source.

CAUTION

An incorrect voltage switch setting may damage the monitor.

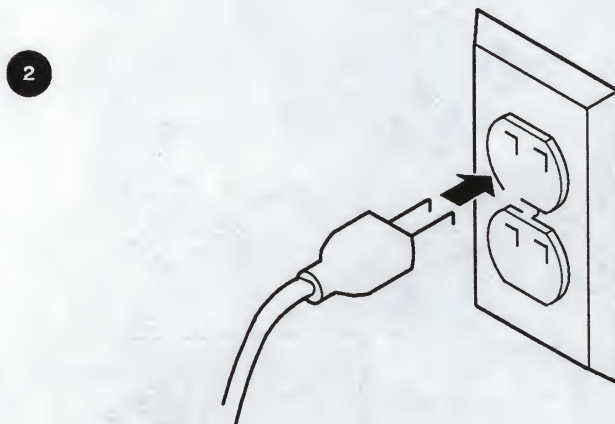
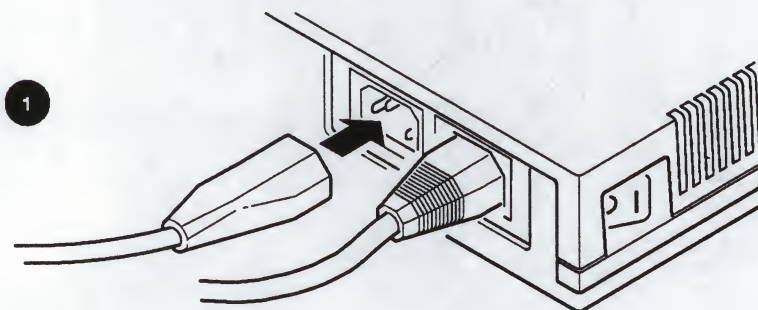
The system box does not have a voltage switch, because it automatically senses and adjusts to the voltage level. The system box works with any standard voltage (110 V to 240 V).

4. Connect one end of the short power cord to the monitor. Plug the other end into the monitor's ac power outlet on the rear of the system box.



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5. Connect one end of the long power cord to the system box.
6. Plug the other end into a grounded electrical wall outlet. If the power cord plug does not match your wall outlet, contact your sales representative and delivery agent to get the correct power cord.



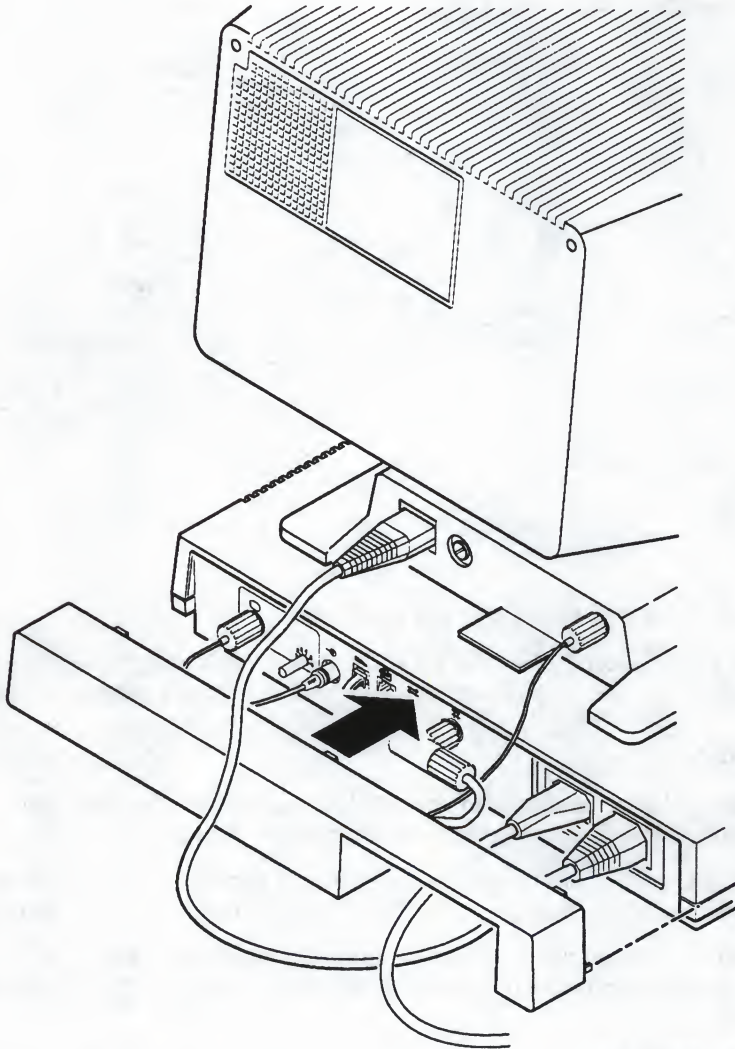
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NOTE

If you received an additional long power cord, it is not needed for this installation.



Attach the rear dress panel.

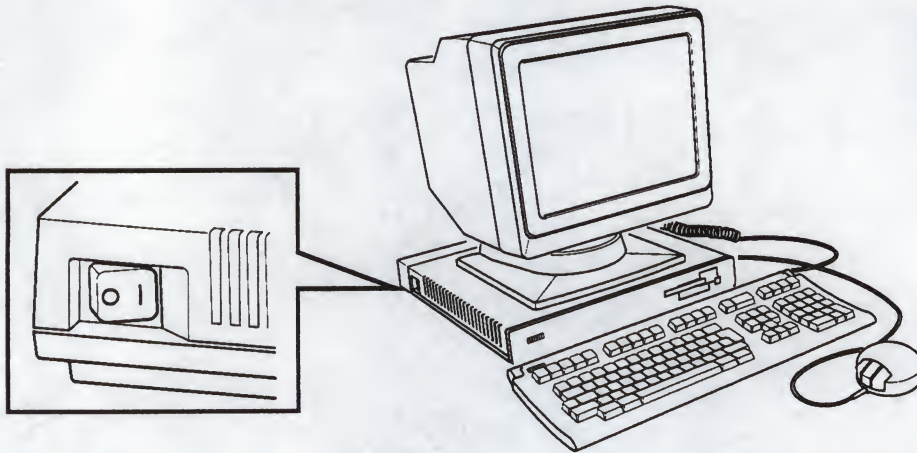
Route all cables under the dress panel. Then push the dress panel onto the rear of the system box until the panel snaps into place.



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Turn on your terminal.

1. Turn on the monitor's  power switch by pressing (|).
2. Make sure the monitor's green power indicator is on.
3. Turn on the system box's  power switch by pressing (|).



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4. Listen for a bell tone from the keyboard.
5. Wait a few seconds for the VT1000 Terminal Manager window to appear with the Digital copyright and a diagnostic messages box.

Final steps . . .

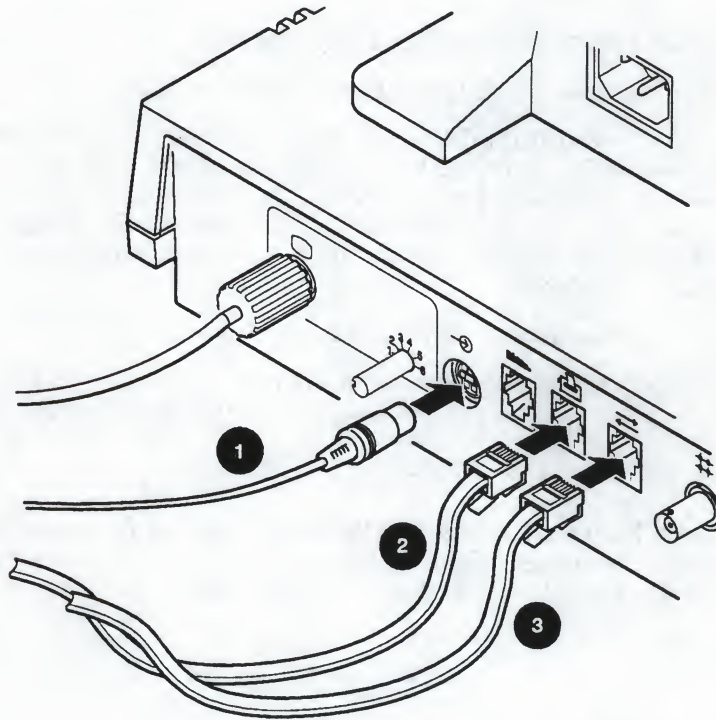
- If you had problems with the installation, review the installation steps carefully. If the problem continues, refer to Chapter 11.
- This is a good time to set the brightness, contrast, and viewing angle of your monitor. See your monitor's installation guide for instructions.
- If you installed optional RAM memory, use the procedure at the end of this chapter to verify that the system recognizes the additional memory.

Otherwise, the installation procedure is complete. You can go to Chapter 3 to begin using your VT1000 video terminal.

Connecting an Optional Printer, Modem, or Tablet

- ❶ **Printer:** Connect the printer cable to the printer port on the rear of the system box.
- ❷ **Modem:** Connect the modem cable to the serial host port or serial printer port on the rear of the system box.
- ❸ **Tablet:** Disconnect the mouse cable from the mouse connector on the rear of the system box and connect the tablet cable.

See Chapter 9 for more information on using printers and modems.



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Installing Memory

This section describes how to install memory boards in the system box. You can install

- Additional random access memory (RAM)
- A new read-only memory (ROM) board

The VT1000 video terminal comes with 1 megabyte of RAM memory. You can add 1, 2, or 3 megabytes of optional RAM memory. Each megabyte of optional memory comes on a 1-megabyte single in-line memory module (SIMM) card. The SIMM cards install on the RAM memory controller board.

Unpack and check the contents of the box.

The next figure shows the different types of memory boards.

- **If you are installing additional RAM memory**, you receive a memory controller board with a 1-megabyte SIMM card installed. If you ordered more than 1 megabyte of RAM memory, you also receive one or two loose SIMM cards. Each SIMM card holds 1-megabyte of RAM memory. You will install the SIMM cards on the memory controller board later.
- **If you are installing a ROM board**, you receive a ROM board.

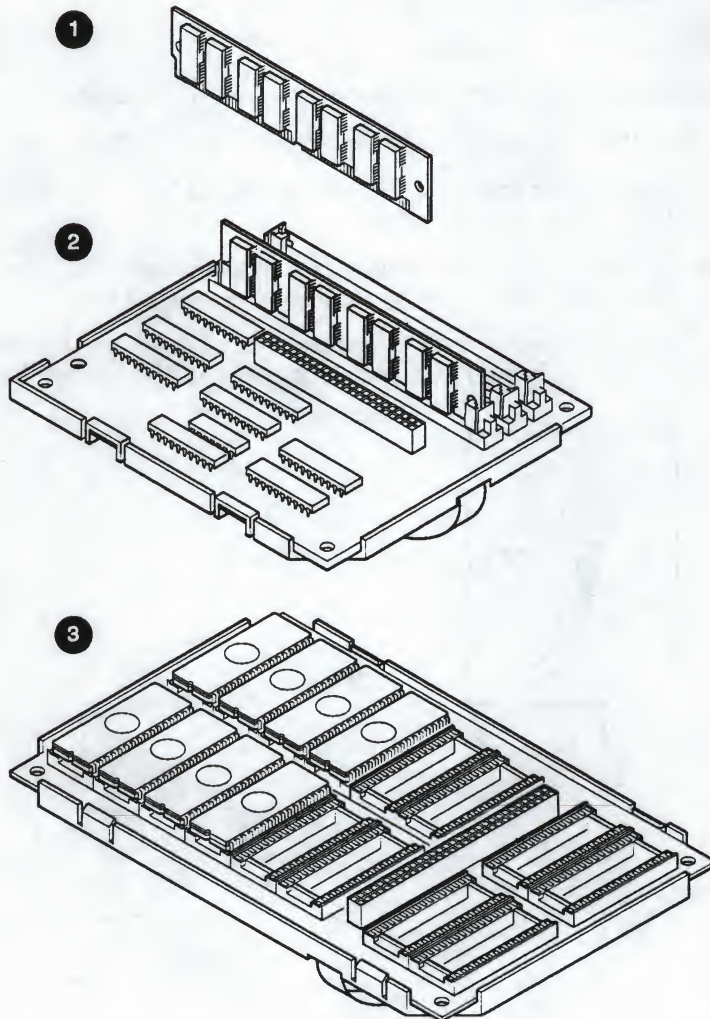
Carefully inspect the components for shipping damage. If you have any missing or damaged items, contact your sales representative and delivery agent.

CAUTION

The memory boards and the SIMM cards can be damaged by electrostatic discharge. Handle the memory board by its cover or strap. Handle the SIMM card by the side edges of the card.

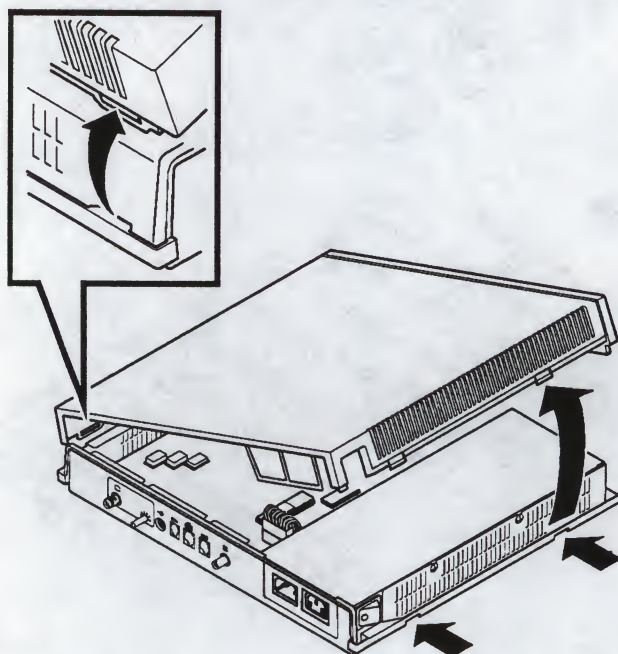
Memory Boards

- ① SIMM card
- ② RAM memory controller board (with one SIMM card preinstalled)
- ③ ROM board



Remove the system box cover.

1. Use a grounding wrist strap and an antistatic mat to perform the installation, if available. Otherwise, frequently touch the metal chassis of the system box during installation, to neutralize any existing static charges.
2. Turn the system box's ☐ power switch off (O).
3. Turn the monitor's ☐ power switch off (O).
4. Disconnect the two power cords from the rear of the system box.
5. Disconnect the monitor video cable from the rear of the system box.
6. Remove the monitor from the top of the system box. You may need two people.
7. Release the top cover of the system box by pressing in the two push tabs on the side of the box with the power switch, as shown.
8. Slowly lift the top cover until you release the hinges on the other side of the box. Then lift the top cover completely off the system box.



Identify the components in the system box.

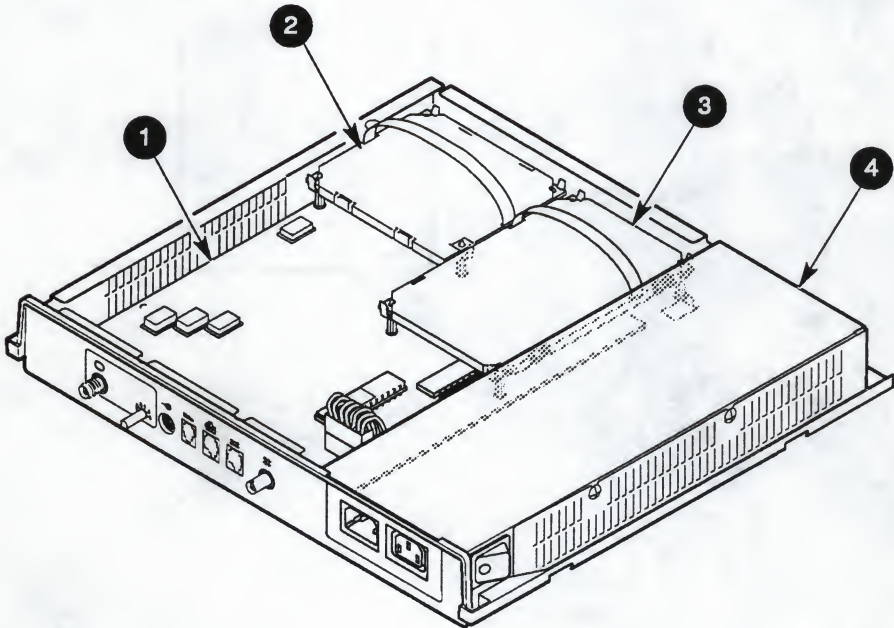
There are four major components in the system box. The memory controller board is shown installed. SIMM cards install on the other side of the memory controller board.

If you are installing optional RAM memory, go to the next section.

If you are installing a ROM board, go to the section entitled "Installing the ROM Board."

System Box Components

- ❶ System logic board
- ❷ RAM memory controller board
- ❸ ROM board
- ❹ Power supply



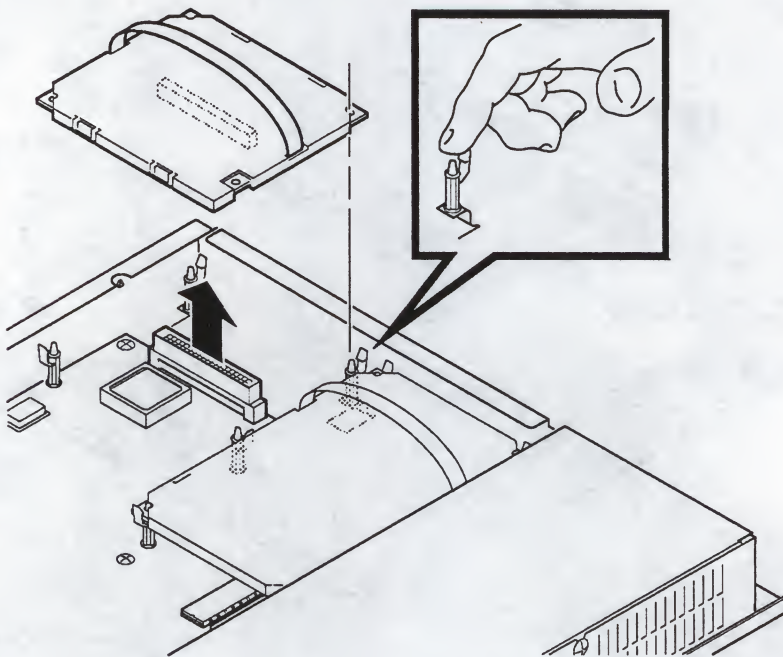
Installing the RAM Memory Controller Board

CAUTION

The memory controller board and the SIMM cards can be damaged by electrostatic discharge. Handle the memory controller board by its cover or strap. Avoid contact with any components or circuitry within the system box.

If your system already has a memory controller board, remove it.

1. Release the standoff clips by gently pushing each clip away from the board and lifting up on the edges of the board.
2. Grasp the strap of the memory controller board and pull up firmly to release the memory controller board connector from the system logic board.
3. Place the board on top of the power supply's metal cover, with the strap side down. You will use the metal cover as a work surface to perform the SIMM board installation.



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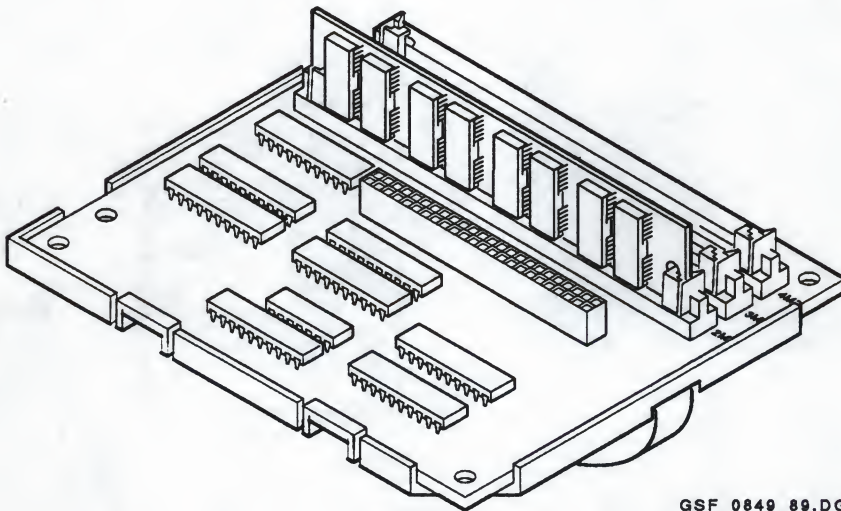
Install the SIMM cards on the memory controller board.

If you ordered 1 megabyte of memory, you can skip this procedure. If you ordered 2 or 3 megabytes of memory, you must install one or two SIMM cards on the memory controller board.

1. Remove the new memory controller board and the one or two small SIMM cards from the shipping bag.
2. Place them on top of the power supply's metal cover, with the strap side of the memory controller board facing down. Use the metal cover as a work surface to install the SIMM cards. This prevents electrostatic damage.
3. The memory controller board has one SIMM card preinstalled in the connector labeled 2MB. Install the next SIMM card in the connector labeled 3MB and the last SIMM card in the connector labeled 4MB, as follows.

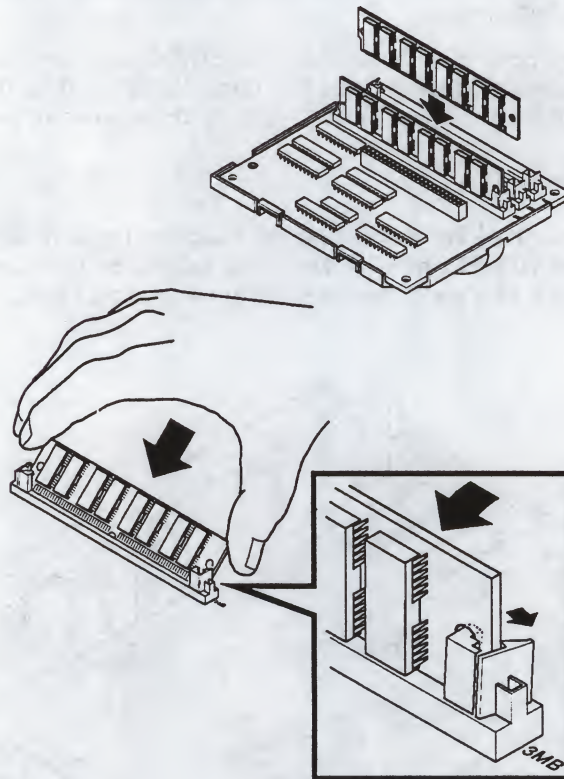
CAUTION

SIMM cards can be damaged by electrostatic discharge. Handle the SIMM card by the side edges of the card. Avoid contact with the gold contact fingers on the card.



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- a. Insert the SIMM card into the connector at a 45-degree angle. Face the components on the SIMM card toward the components on the memory controller board. Line up the center key slot on the SIMM card with the connector key on the memory controller board.
- b. Push down on the top of the SIMM card to securely seat the card in the connector.
- c. Raise the SIMM card into a standup position, until both sides of the card lock into the connector tabs.

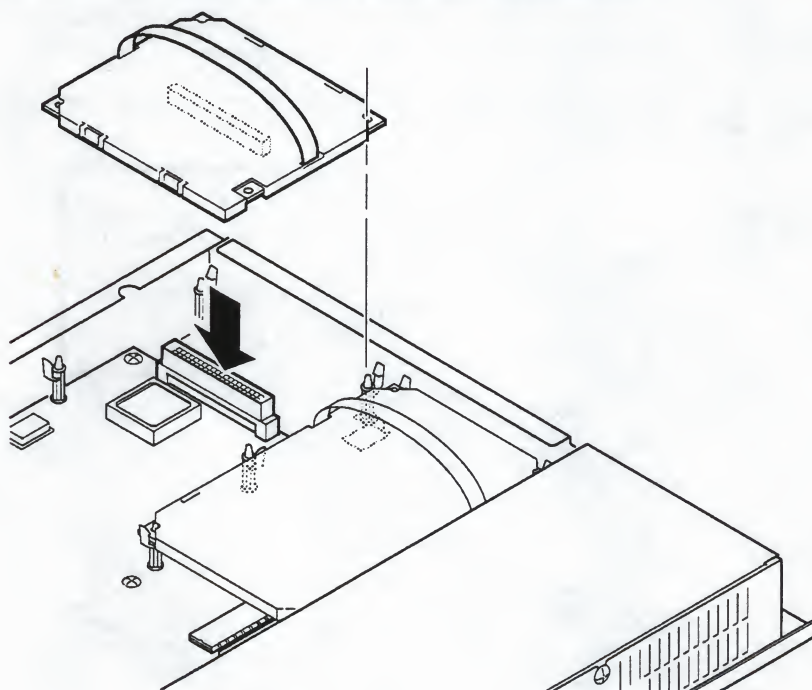


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To remove the SIMM card: Gently push outward on the tabs at the sides of the connector. Tilt the SIMM card forward at a 45-degree angle, toward the edge of the RAM board. Grasp the edges of the SIMM card firmly and lift the card out of the connector.

Install the memory controller board into the system box.

1. Grasp the strap of the memory controller board.
2. Carefully place the board on top of its connector and standoffs in the system box. Use the standoffs as guides to align the connector on the board with the connector in the system box.
3. Press down firmly on the board and its edges to seat the connector and lock each of the four standoff clips.
4. Go to the section entitled "Replace the system cover."



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NOTE

If you have problems, recheck the installation procedures carefully. If the problem continues, contact Digital Customer Services.

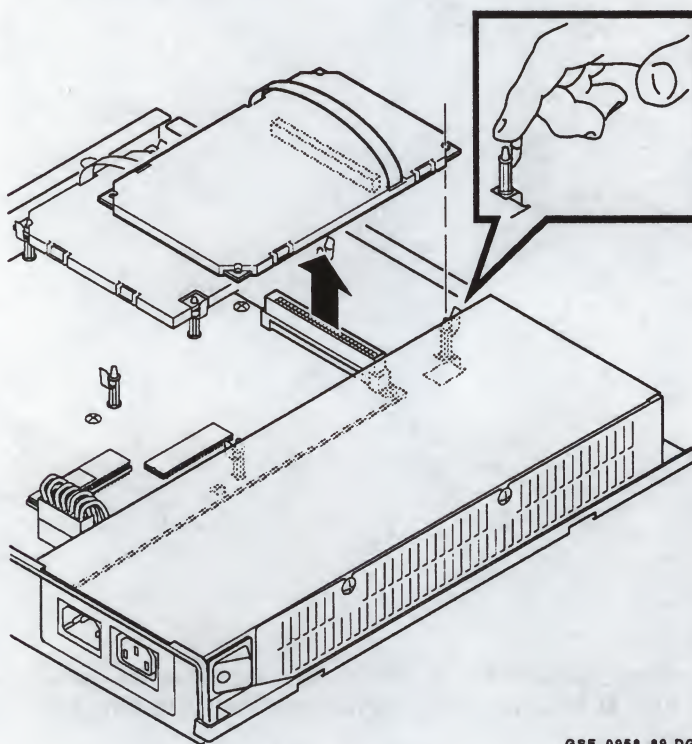
Installing the ROM Board

CAUTION

The ROM board can be damaged by electrostatic discharge. Handle the ROM board by its cover or strap. Also avoid contact with any components or circuitry in the system box.

Remove the old ROM board from your system box.

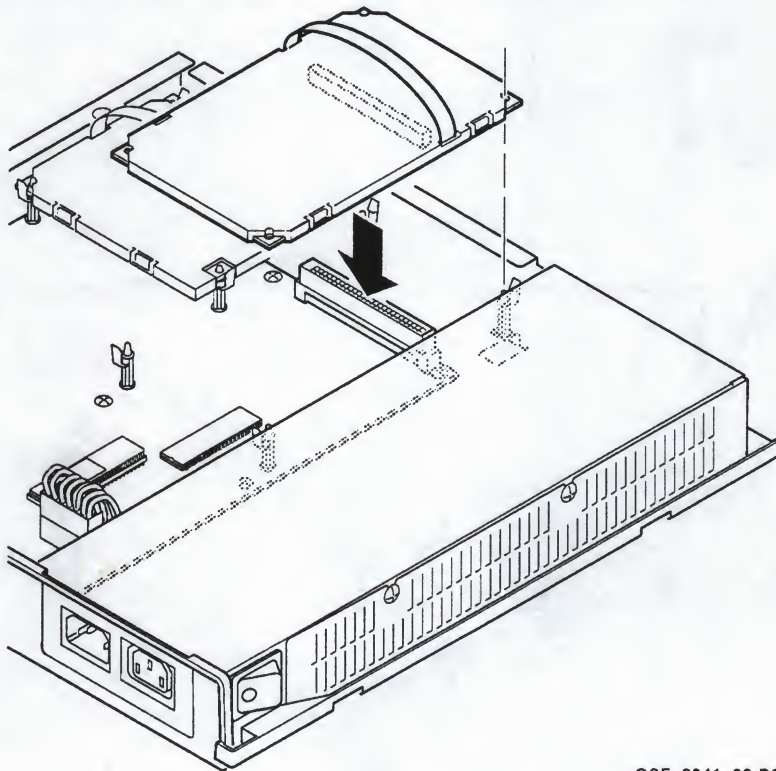
1. Release the standoff clips by gently pushing each clip away from the board and lifting up on the edges of the board.
2. Grasp the strap of the ROM board and pull up firmly to release the ROM board connector from the system logic board.
3. Place the board on top of the power supply's metal cover, with the strap side down.



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Install the new ROM board into the system box.

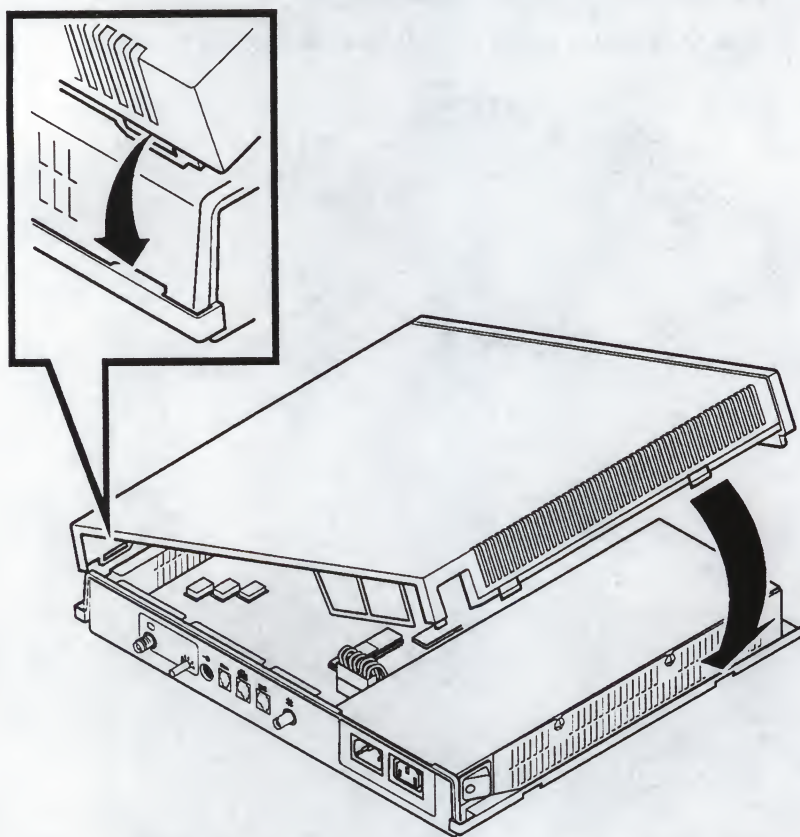
1. Remove the new ROM board from the box and shipping bag.
2. Grasp the strap of the new ROM board.
3. Carefully place the board on top of the ROM connector and standoffs in the system box. Use the standoffs as guides to align the connector on the board with the connector in the system box.
4. Press down firmly on the board and its edges to seat the connector and lock each of the four standoff clips.
5. Continue to the next section to replace the system box cover.



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Replace the system box cover.

1. From the rear of the system box, place the left side of the top cover onto the hinge tabs in the left side of the system box.
2. Gently lower the right side of the top cover onto the system box. Make sure the power connector frame slides into the slot behind the power connectors.
3. Push down on the right side of the top cover until it snaps into the two push tabs, locking it in place.



After Installing the Memory Controller Board or ROM Board...

If you installing the VT1000 terminal, go back to the beginning of this chapter and continue the installation procedure.

If not, perform the following steps:

1. Place the monitor on top of the system box. Leave enough room to connect cables on the rear of the system box and monitor.
2. Connect the two power cords to the rear of the system box.
3. Connect the monitor video cable to the rear of system box.
4. Turn on the system box's ☐ power switch by pressing (|).
5. Turn on the monitor's ☐ power switch by pressing (|).

Verifying the Installation of Optional RAM Memory

The VT1000 Terminal Manager window should be displayed on your screen.

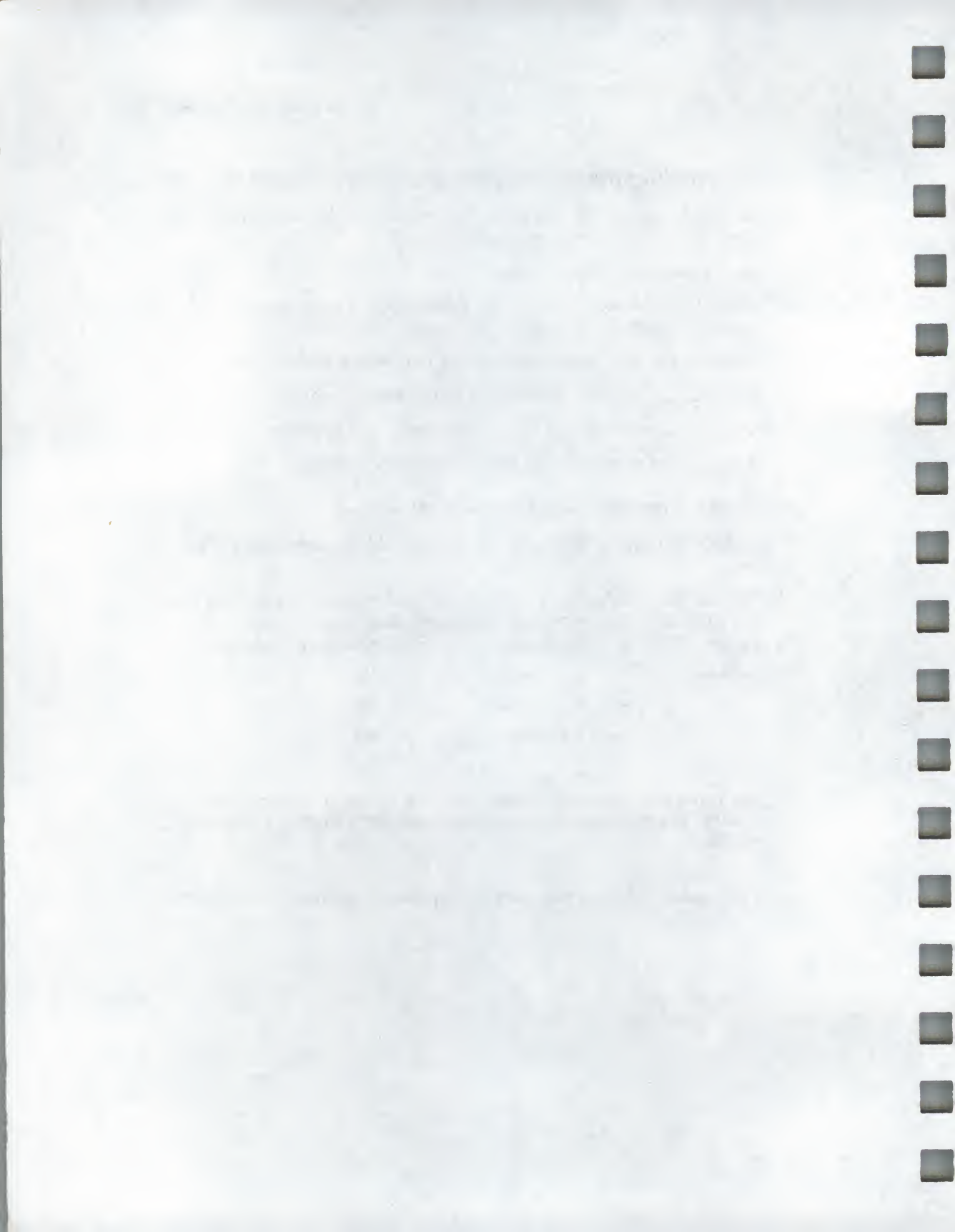
Verify that the number on the right side of the Memory Remaining scale displays the correct number of total megabytes in your system.

Standard	+	Optional	=	Number Displayed
1 megabyte		1 megabyte		2M
		2 megabytes		3M
		3 megabytes		4M

NOTE

If you have problems, recheck the installation procedures carefully. If the problem continues, contact Digital Customer Services.

The installation procedure for optional memory is complete.



Using Your VT1000 Video Terminal

3

Getting Started

This chapter provides step-by-step procedures on how to begin using your VT1000 with a host computer. The chapter also introduces some of the VT1000 screens and menus.

You can use your VT1000 with the VMS, ULTRIX, or UNIX operating systems. You can open two types of sessions on these systems: a video terminal session or X window session. Before you start, you should set the terminal to use the desired display language and keyboard type. By default, the VT1000 uses the English language and the North American keyboard type.

The chapter includes sections on:

- Using a mouse
- Windows
- Choosing the correct display language and keyboard type
- Opening a session on a VMS host system
- Opening a session on a UNIX or ULTRIX host system
- Ending a session

Before You Start

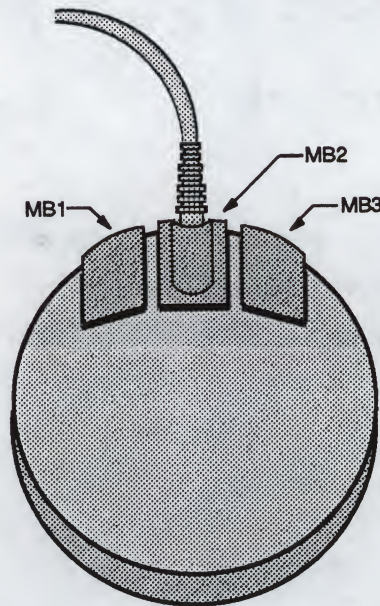
When you work with windowing applications, you use your mouse to perform many operations—from making menu selections to manipulating windows on the screen. Before you open your first windowing session, you must learn how to use the mouse.

Using the Mouse

Your mouse lets you move quickly and easily through windowing applications. You simply point to an object on your screen and click a button. The mouse has three buttons:

- MB1 (mouse button 1) on the left
- MB2 in the middle
- MB3 on the right

This button arrangement normally suits right-handed users. If you are left-handed, you can reverse the position of MB1 and MB3 by changing the **Button Arrangement** setting in the Customize Pointer dialog box (Chapter 5).



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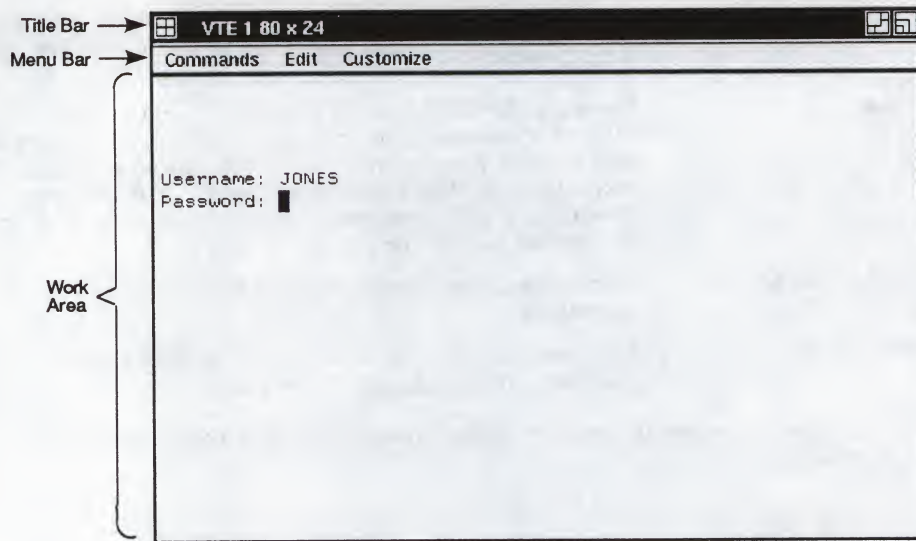
In X window applications, you can perform six basic actions with the mouse.

- Point** Move the mouse on your desk. This moves the cursor to where you want the next action to occur.
- Click** Quickly press and release MB1. You should hear and feel a faint click.
- Press** Point to a menu name or other item where you want the action to occur. Without moving the mouse, press and hold MB1. If you are pointing at a menu name, pressing MB1 pulls down a menu and keeps it down until you release MB1.
- Drag** Press and hold MB1, move the pointer, and release MB1. For example, you drag a window outline to move it to another place on your screen. To cancel a drag in progress, click MB3 before releasing MB1. If you are displaying a pull-down menu, cancel the drag by moving the pointer outside the menu.
- Double click** Point to the object and click MB1 twice in quick succession.
- Shift click** Point to the object. Press and hold the **Shift** key and click MB1. Then release the **Shift** key.

You will get a chance to practice these movements when you open your first session.

What Are Windows?

A window is an area on your screen that represents all or part of an application. You can use windows to view several applications at once. You can move windows on the screen, organizing information for easier use. The video terminal (VTE) window is one of several windows available on your VT1000 terminal.

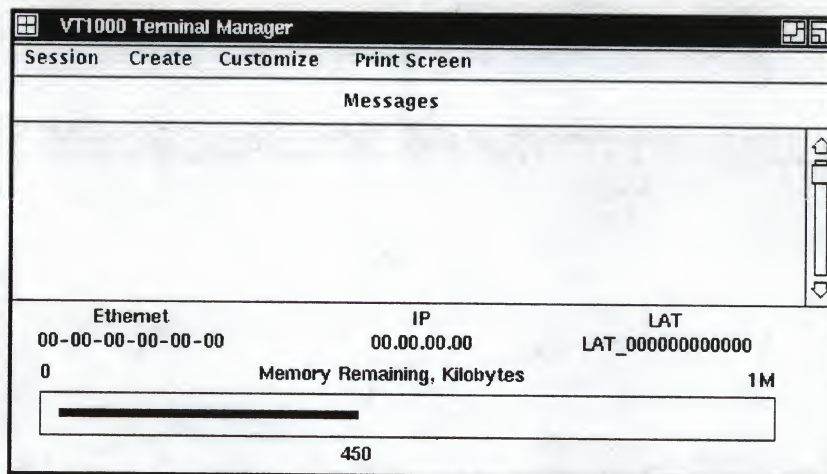


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- The **title bar** at the top identifies the window.
- The **menu bar** below the title bar lets you choose the application's commands.
- The **work area** displays the application's text and graphics.

VT1000 Terminal Manager Window

You use the VT1000 Terminal Manager window to start every session. The menu bar of this window contains the names of four pull-down menus: Session, Create, Customize, and Print Screen.



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All Diagnostics Passed

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Chapter 5 describes the VT1000 Terminal Manager in detail.

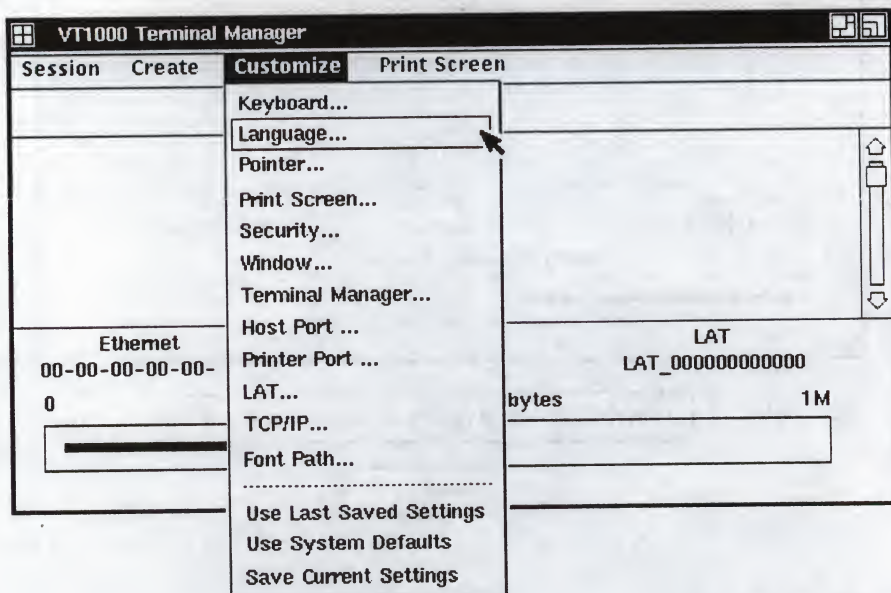
If you are unfamiliar with using pull-down menus, you may want to read the information in Chapter 4 before continuing.

Choosing the Display Language

You can display the VT1000 Terminal Manager window, system messages, and other menus in English, French, or German. The display language is initially set to English.

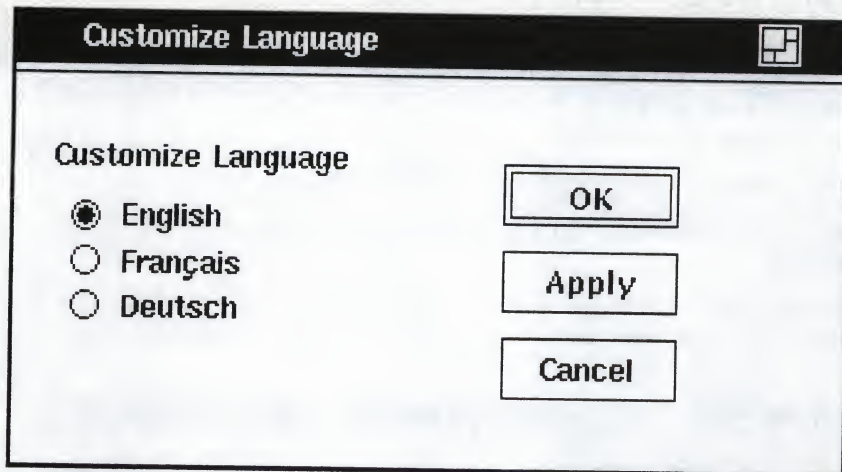
To change the display language:

1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. Point to the **Customize** menu name in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Customize menu.



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3. Drag the pointer to the **Language ...** menu item. The Customize Language dialog box appears.



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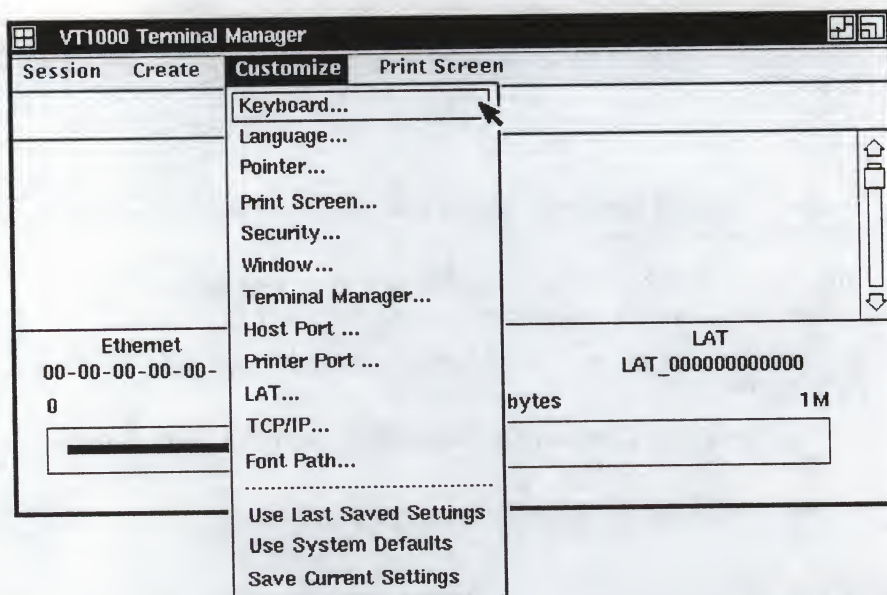
4. In the Customize Language dialog box, click on the button next to your language choice.
5. Click on the **OK** button to record your choice and dismiss the Customize Language dialog box.
6. Save your setting so you do not have to enter it each time you turn on the terminal.
 - Pull down the **Customize** menu from the VT1000 Terminal Manager's menu bar.
 - Choose the **Save Current Settings** menu item.

Choosing the Correct Keyboard Type

The VT1000 has many keyboard types for different languages and dialects. The terminal is initially set to work with the North American/United Kingdom keyboard. If you have another keyboard, you must change the setting.

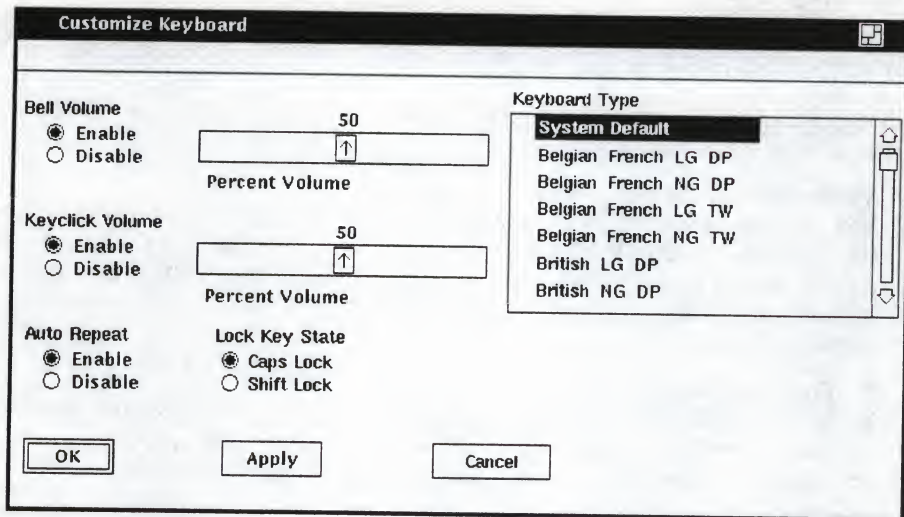
To change the keyboard type:

1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. Point to the **Customize** menu in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Customize menu.



GSF_1708_89.RAGS

3. Drag the pointer to the **Keyboard ...** menu item. The Customize Keyboard dialog box appears.



GSF_1046_89.RAGS

4. Turn the keyboard upside down and look for a label that specifies the model number. The model number should be in a format similar to LK401-xx or nn-nnnnn-xx. Use the xx value to choose your keyboard type from the Keyboard Type scroll box.

For example, if you have a Belgian French keyboard and the model number is LK401-NG, you choose either Belgian French NG DP or Belgian French NG TW. The DP and TW designations select either the data processing or typewriter characters on the keyboard. (See Chapter 5 for details.)

5. In the Keyboard Type scroll box, click on the arrows until the keyboard you want appears.
6. Click on the correct keyboard entry.
7. Click on the **OK** button to record your choice and dismiss the Customize Keyboard dialog box.
8. Save your setting so you do not have to enter it each time you turn on the terminal.
 - Pull down the **Customize** menu from the VT1000 Terminal Manager's menu bar.
 - Choose the **Save Current Settings** menu item.

Starting a Session on Your Host System

You can use your VT1000 terminal to open sessions on the VMS, ULTRIX, or UNIX operating systems.

You can run two types of sessions on a host computer with your VT1000 terminal:

Video Terminal Sessions

You can use your VT1000 as a video text terminal. The VT1000 has a video terminal (VTE) window that lets you log in to a host as you would on a conventional video terminal. The VT1000's VTE window offers the features of Digital's VT320 terminal with some enhancements.

X Window Sessions

To use an X window session, you log in to a host and use that host's X window software. In an X window session, you can use all the applications and utilities provided in the X Window System.

You can run an X window session and a VTE session at the same time. The X window session appears in one window, while the VTE session appears in another. You can only run one X session at a time. You can run several VTE sessions at a time.

The following sections show you how to:

- Start a video terminal session on a VMS system.
- Start an X window session on a VMS system.
- Start a video terminal or X window session on an ULTRIX or UNIX system.
- Start a video terminal session using the serial host port.

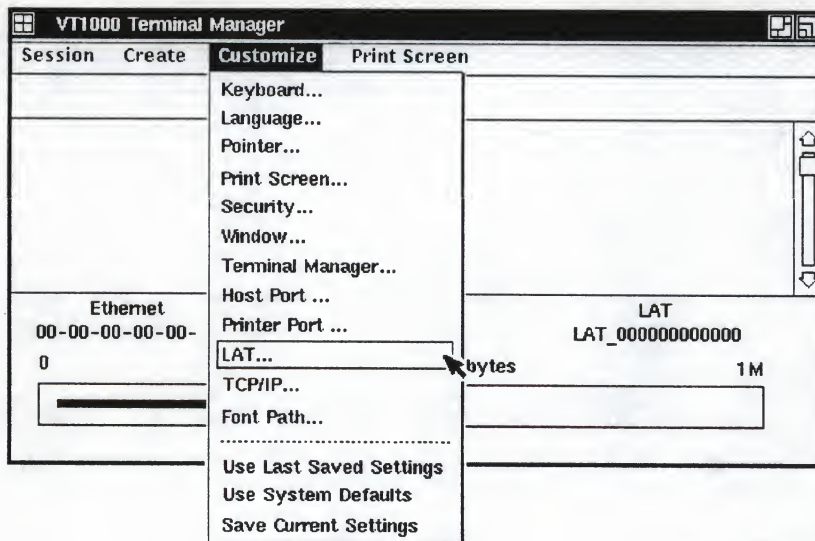
Starting a Video Terminal Session on a VMS System

This section describes how to start a video terminal (VTE) session on a VMS host system, using a local area transport (LAT).

If you are using the VT1000 for the first time, you will need to enter one or more LAT group codes to begin a session. See your system manager to find out what group codes you can use.

1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. To connect to a host or service on the network, you need to enter and save one or more LAT group codes in the terminal's memory. Your system manager can provide the group codes for your network. If you have already entered the group codes, go to step 6.

Point to the **Customize** menu name in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Customize menu.



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3. Drag the pointer to the **LAT ...** menu item. The Customize LAT dialog box appears.

Customize LAT

LAT Connections

☐ All

☒ Authorized only

☐ None

Group Codes

1
20
133
146

Add All

Remove All

Add Remove

LAT VTE Circuit Timer 80

↑

Milliseconds

Retransmit Limit 8

↑

Messages

LAT X Circuit Timer 30

↑

Milliseconds

Keep Alive Timer 20

↑

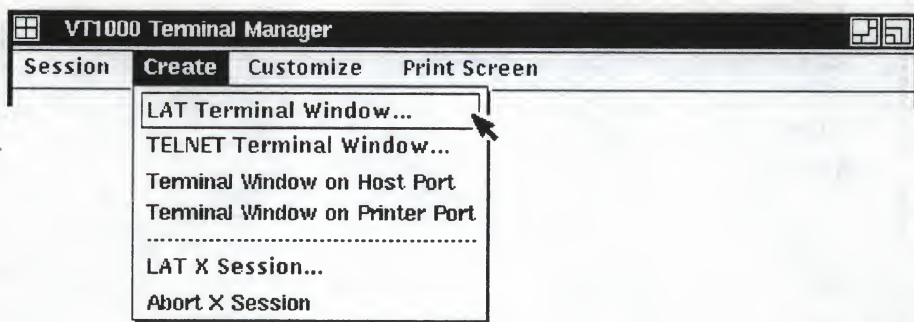
Seconds

OK Apply Cancel

GSF_1054_89.RAGS

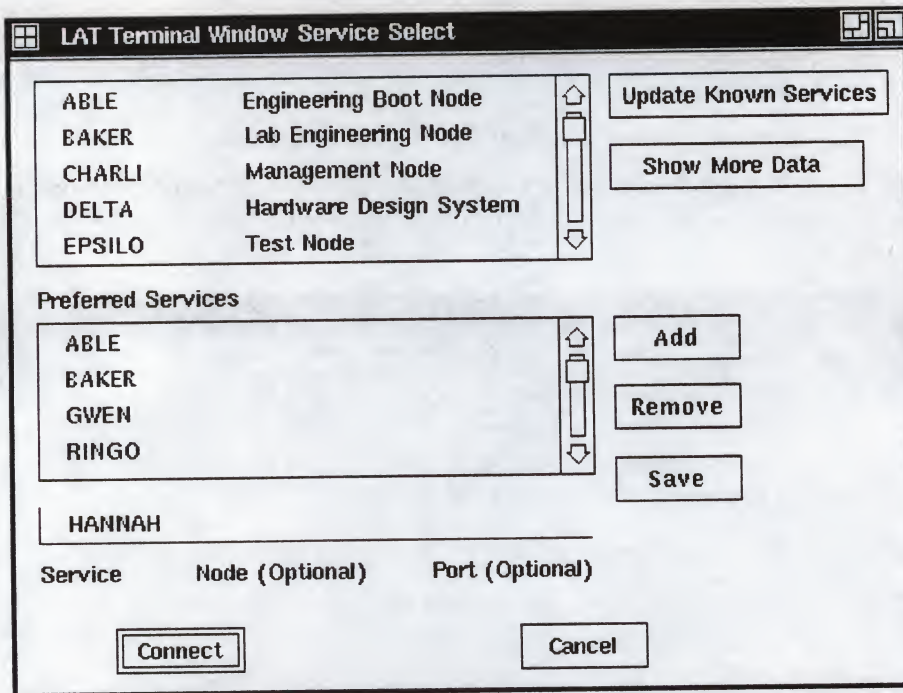
4. Enter a group code into the Customize LAT dialog box.
 - Click on the text entry field below the Group Codes scroll box. A text cursor appears.
 - Use your keyboard to enter a group code.
 - Click on the **Add** button. The new group code appears in the Group Codes scroll box.
 - Repeat this procedure for each group code you want to add.
 - Click on the **OK** button to dismiss the Customize LAT dialog box.

5. Save your group code(s) so you do not have to enter them each time you turn on the terminal.
 - Pull down the **Customize** menu from the VT1000 Terminal Manager's menu bar.
 - Choose the **Save Current Settings** menu item.
6. Point to the **Create** menu name in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Create menu.



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7. Choose the **LAT Terminal Window ...** menu item. The LAT Terminal Window Service Select dialog box appears.



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8. Choose a host system and connect to it.

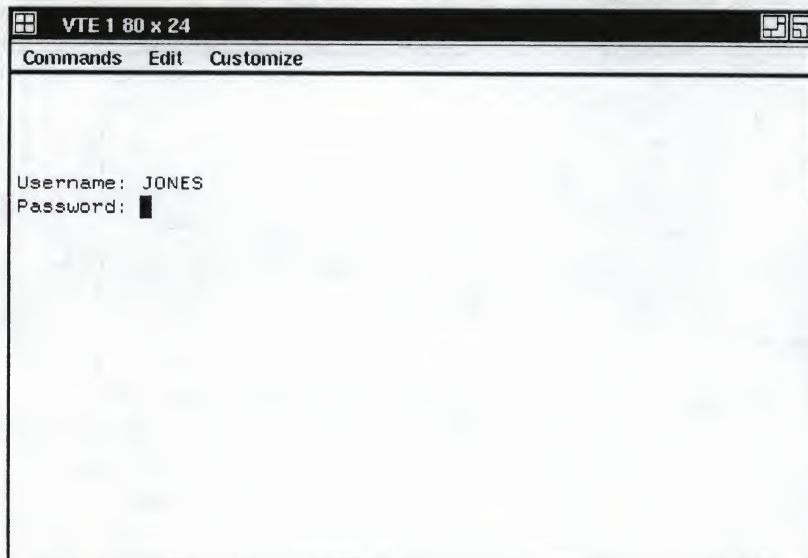
Step	Result
1 Click on the Update Known Services button.	The names of the hosts you can access appear in the scroll box at the top of the dialog box. The host names should correspond to the group codes you have entered.

NOTE

You may have to click on the **Update Known Services** button several times before the host you want appears. Sometimes it takes a few minutes for the VT1000 to establish communication with a host on the network.

Step		Result
2	Click on the name of the host you want to log into.	The host name is highlighted.
3	Click on the Add button.	The host appears in the Preferred Services scroll box and in the text entry field under the scroll box. Only add those hosts that you frequently log in to.
4	Click on the Save button.	The VT1000 saves the host names you added to the Preferred Services scroll box, so you do not have to enter them each time you turn your terminal on.
5	In the Preferred Services scroll box, click on the host you want to connect to.	The host is selected for connection.
6	Click on the Connect button.	A video terminal (VTE) window appears.

9. Log in to the host as you would on a conventional video terminal.



Starting an X Window Session on a VMS System

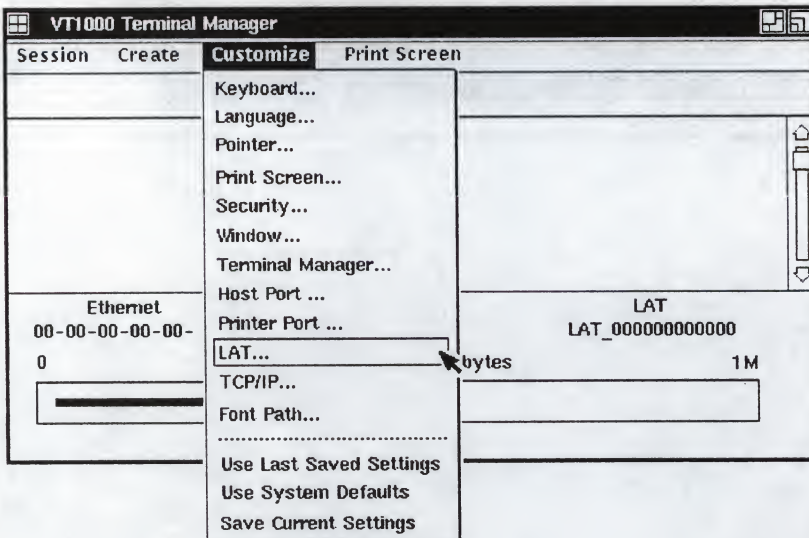
This section describes how to start an X window or DECwindows session on a VMS host system, using a local area transport (LAT). If you are using the VT1000 for the first time, you need the following information before you begin a session.

- One or more LAT group codes
- A LAT font path

Your system manager can provide you with the group codes and font path for your network.

1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. To connect to a host or service on the network, you may need to enter and save one or more LAT group codes in the terminal's memory. If you have already entered the group codes you need, go to step 6.

Point to the **Customize** menu name in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Customize menu.



GSF_1710_89,RAGS

3. Drag the pointer to the **LAT ...** menu item. The Customize LAT dialog box appears.

Customize LAT

LAT Connections

☐ All

☒ Authorized only

☐ None

Group Codes

1
20
133
146

Add All
Remove All

Add Remove

LAT VTE Circuit Timer

80

↑

Milliseconds

Retransmit Limit

8

↑

Messages

LAT X Circuit Timer

30

↑

Milliseconds

Keep Alive Timer

20

↑

Seconds

OK Apply Cancel

GSF_1054_89.RAGS

4. Enter a group code in the Customize LAT dialog box.
 - Click on the text entry field below the Group Codes scroll box. A text cursor appears.
 - Use your keyboard to enter a group code.
 - Click on the **Add** button. The new group code appears in the Group Codes scroll box.
 - Repeat this procedure for each group code you want to add.
 - Click on the **OK** button to dismiss the Customize LAT dialog box.

5. Save your group code(s) so you do not have to enter them each time you turn on the terminal.

- Pull down the **Customize** menu from the VT1000 Terminal Manager's menu bar.
- Choose the **Save Current Settings** menu item.

6. Some applications require special character fonts to run properly. A font path lets the VT1000 access these character fonts.

You need to enter and save a LAT font path in the terminal's memory. Your system manager can provide the font path. If you have already entered the font path, go to step 9.

Pull down the Customize menu and choose the **Font Path . . .** menu item. The Customize Font Path dialog box appears.

Customize Font Path

Font Path Selection

☒ LAT Font Path

☐ TFTP Font Path

LAT Font Path ROM,

TFTP Font Path ROM,

OK Apply Cancel

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7. Enter a font path into the Customize Font Path dialog box.

- Click on the **LAT Font Path** button under the Font Path Selection title.
- Click on the text entry field next to the word ROM. A text cursor appears.

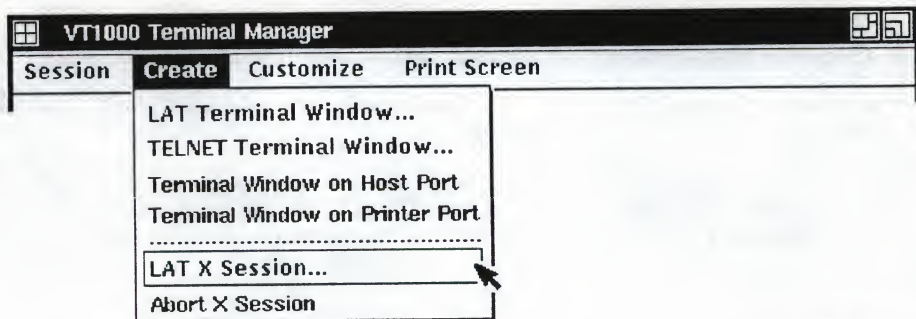
- Use your keyboard to enter a comma (,) followed by a font host name.
For example:

```
|ROM,beta::sys$fonts:
```

- Repeat this procedure for each font path.
- Click on the **OK** button to dismiss the Customize Font Path dialog box.

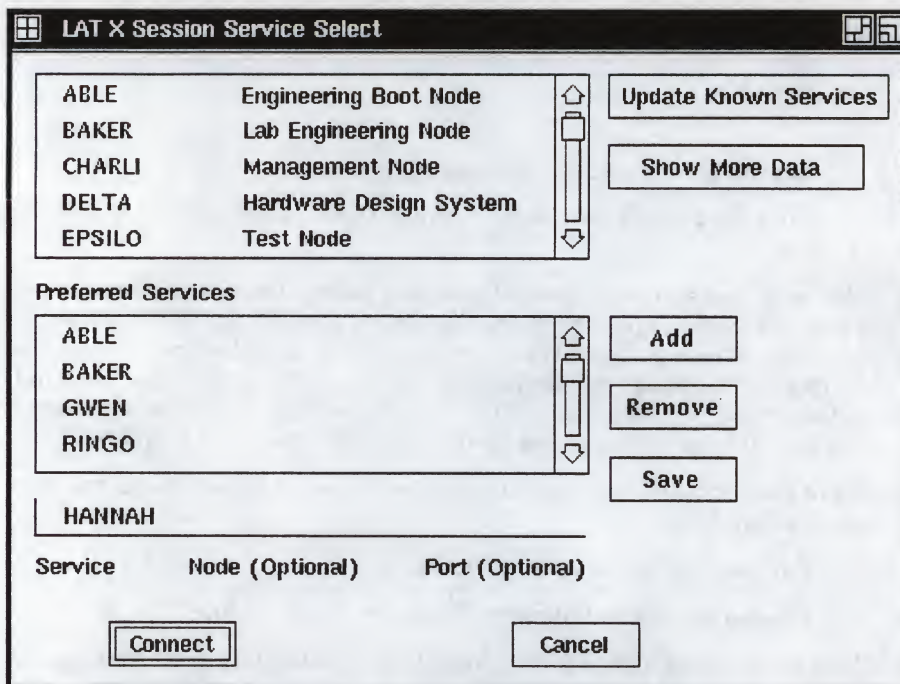
You may have to wait several minutes before the message **Set font path succeeded** appears in the Messages area of the VT1000 Terminal Manager window. Sometimes it takes a few minutes for the terminal to receive the message identifying the font path host. The terminal retries every 30 seconds. If the wait is too long, your system manager may be able to increase the host's multicast message frequency.

8. Save the font path so you do not have to enter it each time you turn on the terminal.
 - Pull down the **Customize** menu.
 - Choose the **Save Current Settings** menu item.
9. Pull down the **Create** menu from the VT1000 Terminal Manager's menu bar.



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10. Choose the **LAT X Session ...** menu item. The LAT X Session Service Select dialog box appears.



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11. Choose a host system and connect to it.

Step	Result
1 Click on the Update Known Services button.	The names of the hosts you can access appear in the scroll box at the top of the dialog box. The host names should correspond to the group codes you have entered.

NOTE

You may have to click on the **Update Known Services** button several times before the host you want appears. Sometimes it takes a few minutes for the VT1000 to establish communication with a host on the network.

Step		Result
2	Click on the name of the host you want to log into.	The host name is highlighted.
3	Click on the Add button.	The host appears in the Preferred Services scroll box and on the text entry field under the scroll box. Only add those hosts that you frequently log in to.
4	Click on the Save button.	The VT1000 saves the host names you add to the Preferred Services scroll box, so you do not have to enter them each time you turn your terminal on.
5	In the Preferred Services scroll box, click on the host you want to connect to.	The host is selected for connection.
6	Click on the Connect button.	A Start Session dialog box appears

12. Log in to the X window session with the same username and password you use for video terminal sessions. After you log in to the X window session, the host-based session manager starts up.

Start Session

Username

Password

OK
Clear

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Starting a Video Terminal or X Window Session on an ULTRIX or UNIX System

This section describes how to start a video terminal (VTE) session or an X window session on a UNIX or ULTRIX host system, using TCP/IP TELNET or TCP.

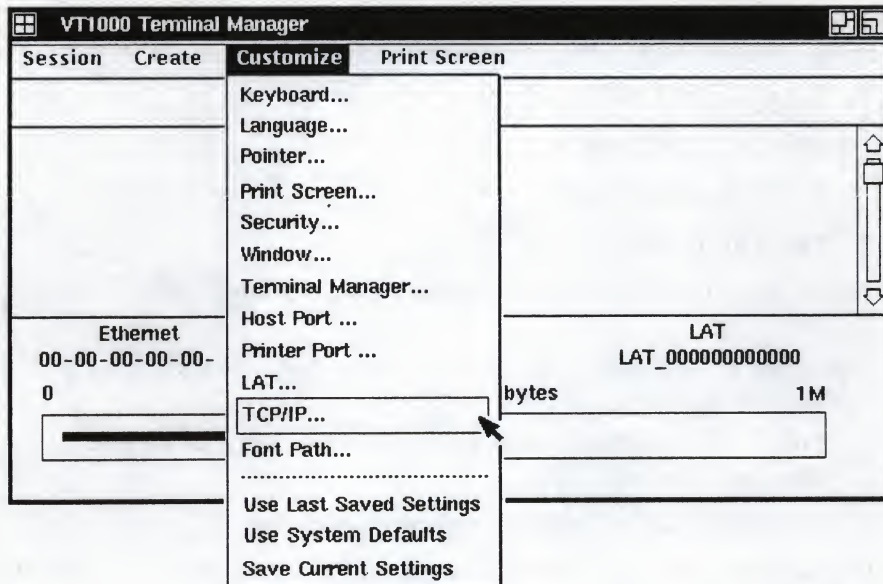
If you are using the VT1000 for the first time, you need the following information before you begin a session.

- An IP address to assign to your terminal
- One or more IP addresses for the host(s) you want to connect to
- A font path file (for X window sessions only)

Your system manager can provide you with the IP addresses and a pointer to a font path file.

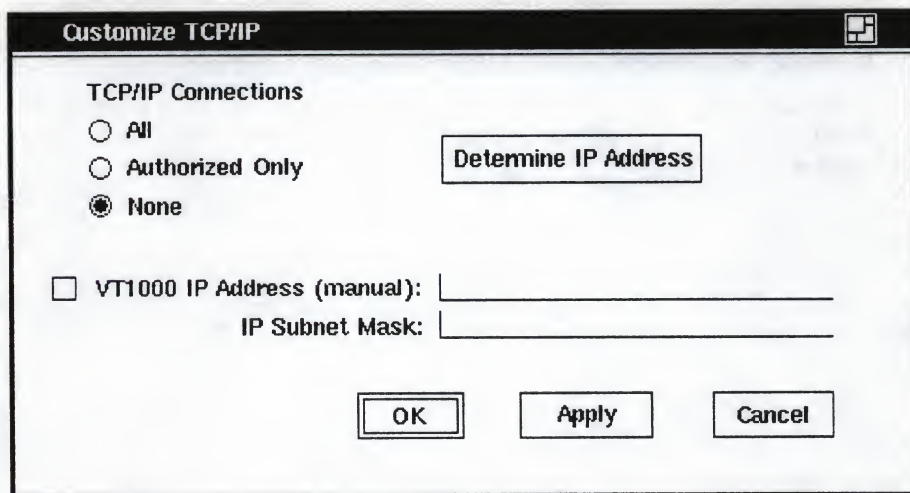
1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. To let other hosts and nodes on the network communicate with your VT1000 terminal, you need to enter and save an IP address. Your system manager can provide you with an IP address to assign to your terminal. If you have already entered an IP address, go to step 6.

To enter your terminal's IP address, point to the **Customize** menu name in the VT1000 Terminal Manager's menu bar. Click and hold MB1 to pull down the Customize menu.



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3. Drag the pointer to the **TCP/IP ...** menu item. The Customize TCP/IP dialog box appears.



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4. Enter your terminal's IP address into the Customize TCP/IP dialog box.

- Click on the text entry field next to the title:

VT1000 IP Address (manual):

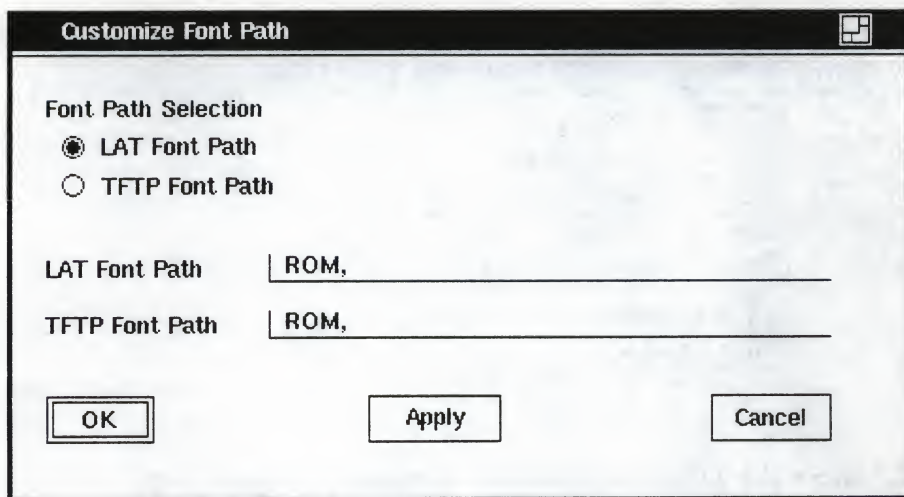
A text cursor appears.

- Enter an IP address.
 - Click on the **OK** button to dismiss the Customize TCP/IP dialog box.
5. Save your IP address so you do not have to enter it each time you turn on the terminal.
 - Pull down the **Customize** menu from the VT1000 Terminal Manager window.
 - Choose the **Save Current Settings** menu item.
 6. **If you are starting a video terminal (VTE) session, go to step 9.**

If you are starting an X window session, perform the following steps to enter and save a font path in the VT1000 memory. If you have already entered the font path, go to step 9.

Some applications require special character fonts to run properly. A font path lets the VT1000 access these character fonts. You need to enter and save a font path in the terminal's memory. Your system manager can provide the font path for your VT1000.

To enter a font path, pull down the Customize menu and choose the **Font Path ...** menu item. The Customize Font Path dialog box appears.

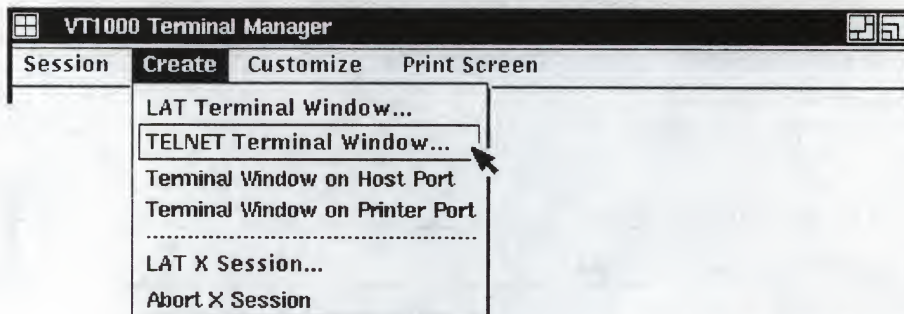


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7. Enter a font path into the Customize Font Path dialog box.
 - Click on the **TFTP Font Path** button under the Font Path Selection title.
 - Click on the text entry field next to the word ROM. A text cursor appears.
 - Use your keyboard to enter a comma (,) followed by a font host IP address.
For example:

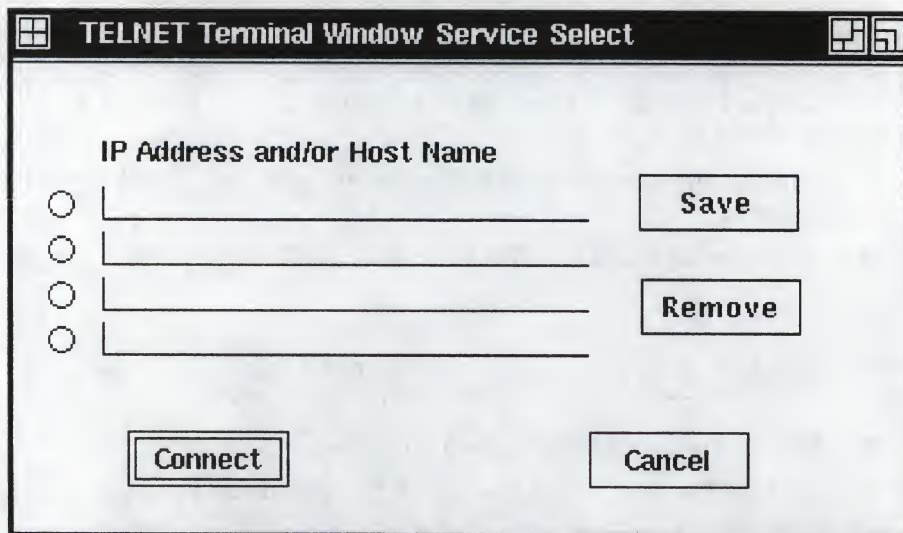
```
|ROM,123.45.67.89:tftpboot/VT1000/font.paths
```
 - Repeat this procedure for each font path.
 - Click on the **OK** button to dismiss the Customize Font Path dialog box.
8. Save the font path so you do not have to enter it each time you turn on the terminal.
 - Pull down the **Customize** menu from the VT1000 Terminal Manager's menu bar.
 - Choose the **Save Current Settings** menu item.

9. Pull down the **Create** menu from the VT1000 Terminal Manager's menu bar.



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10. Choose the **TELNET Terminal Window ...** menu item. The TELNET Terminal Window Service Select dialog box appears.

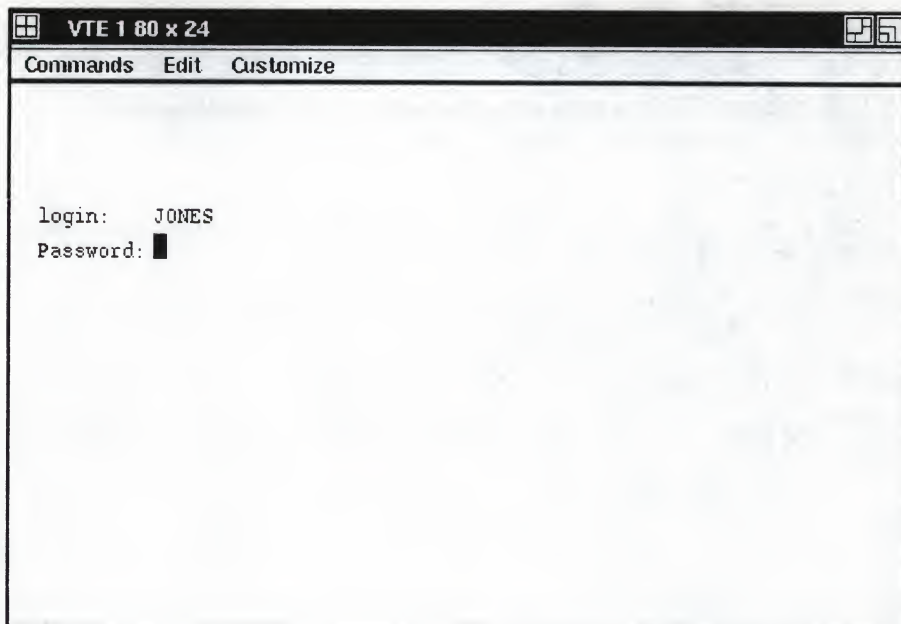


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11. Add one or more host system IP addresses under the **IP Address and/or Host Name** title.

- Click on one of the text entry fields under the IP Address and/or Host Name title. A text cursor appears.
- Enter the IP address of the host you want to connect to. Your system manager can provide you with IP addresses for the hosts on your network.
- Click on the **Save** button to save the IP addresses you enter, so you do not have to enter them each time you turn the terminal on.
- Click on the button next to the name of the host you want to connect to.

12. Click on the **Connect** button. A video terminal (VTE) window appears.



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13. Log in to the host as you would on a conventional video terminal.

14. If you want to run an X window session:

- Enter the appropriate commands to enable your terminal to run an X window application:

If you are using the UNIX C-shell

```
% setenv DISPLAY IP_ADDRESS_OF_YOUR_TERMINAL:0
```

If you are using the UNIX Bourne or Korn shell

```
$ DISPLAY=IP_ADDRESS_OF_YOUR_TERMINAL:0
```

```
$ export DISPLAY
```

- Begin an X window application by entering the appropriate command. For example, the following command starts a DECterm application:

```
$ dxterm
```

- You can also run the DECwindows session manager from your UNIX or ULTRIX host by entering the following command line:

```
$ dxsession
```

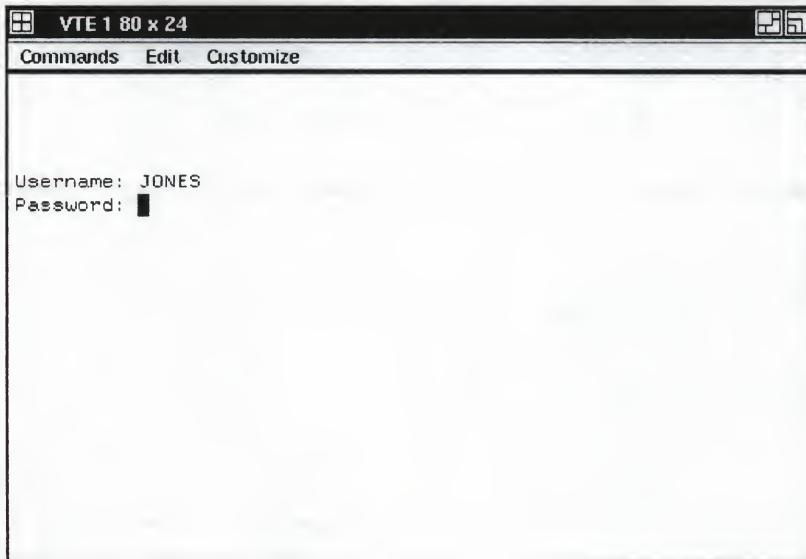
You may want to override the local window manger and enable a remote host-based window manager.

- Choose the **Window . . .** menu item in the Customize menu. The Customize Window dialog box appears.
- Click on the **Allow Remote Window Manager** button.
- Click on the **OK** button to dismiss the Customize Window dialog box.

Starting a Video Terminal Session on the Serial Host Port

This section describes how to start a video terminal (VTE) session on a VMS, UNIX, or ULTRIX host system if you use the serial host port.

1. Turn on the terminal. The VT1000 Terminal Manager window appears.
2. Point to the **Create** menu name in the VT1000 Terminal Manager window. Press and hold MB1 to pull down the Create menu.
3. Drag the pointer to the **Terminal Window on Host Port** menu item. A video terminal (VTE) window appears.
4. Press the **Return** key until the login prompt appears.



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5. Log in to the host as you would on a conventional video terminal.

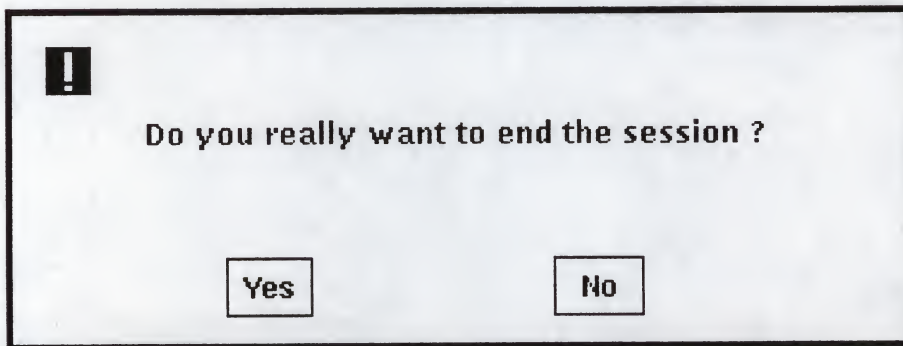
Ending a Session

You can end a session at any time. When you end a session, the terminal:

- Terminates all host connections.
- Deletes all windows on the screen.
- Performs a complete software reset.
- Displays the VT1000 terminal manager window

To end your session:

1. Point to the **Session** menu name in the VT1000 Terminal Manager's menu bar. Press and hold MB1 to pull down the menu.
2. Click on the **Quit** menu item. A dialog box appears, asking you if you really want to end the session.
 - To end the session, click on the **Yes** button.
 - To remain in the session, click on the **No** button.



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4

Using Windows

This chapter describes how to use and manipulate windows in a DECwindows environment. If you are familiar with the DECwindows environment, you may want to skip this chapter.

The chapter includes sections on:

- Selecting and manipulating windows
- Choosing items from pull-down menus
- Supplying information in dialog boxes
- Using scroll bars

Using Windows

This section describes the basic techniques for manipulating windows, including

- Selecting windows
- Moving windows
- Changing the size of windows
- Shrinking windows to icons and reexpanding them
- Working with stacked windows

Selecting Windows

The VT1000 video terminal lets you open several windows on the screen. When you have several windows open at one time, you give one window *input focus* by selecting it. Only one window can have input focus at a time.

Window with Input Focus



Window without Input Focus



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To select a window:

1. Point to any location in the window or title bar.
2. Click MB1.

The window's title bar becomes highlighted to indicate it has input focus. Any text you type appears this window, if your application allows text entry. When you select another window, the first window's title bar is no longer highlighted.

Moving Windows

You use the title bar to move the windows on your screen. Windows can overlap one another. If one window partially obscures another, you may want to arrange them so that each is completely visible.



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To move a window:

1. Point to the window's title bar.
2. Press and hold MB1.
An outline of the window appears.
3. Drag the pointer to the new location.
4. Release MB1.

If the window was partially obscured by other windows, it pops to the top of the stack of windows and is given input focus.

To cancel a window-moving operation in progress, click another mouse button before releasing MB1. The outline disappears, and the window does not move.

Changing the Size of Windows

You can make windows larger, to display more information. Or you can make windows smaller, so you can view several applications. To change a window's size, you use the window's resize button.



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To change the size of a window:

1. Point to the window's resize button.
2. Press and hold MB1.

The pointer changes into a small resize cursor.

3. Drag the resize cursor until the window is the size you want.

To make the window larger, drag the resize cursor beyond the window border and release MB1.

To make the window smaller, drag the resize cursor beyond the window border and then back in.

4. Release MB1.

You can change the size of a window in one dimension (height or width) or in both dimensions.

- To change the size in one dimension, drag the resize cursor across one border of the window. As long as you cross only one border, the outline that follows the resize cursor changes in only one dimension.
- To change the size in both dimensions, drag the resize cursor across two adjacent borders.
- If you drag the resize cursor through two *opposite* borders, the first border you crossed returns to its original location and the other border becomes an outline that follows the resize cursor.

To cancel a window-resizing operation in progress, click another mouse button before releasing MB1. The outline disappears, and the window remains at its original size.

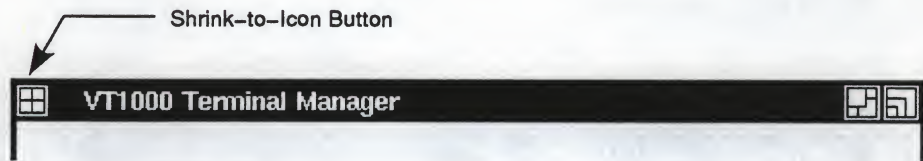
Shrinking Windows to Icons

When you start an application, its icon appears in the Icon Box. The Icon Box is a short window that stretches across the top of the screen. While the application is running in a window, its icon is dimmed.

If you want to run an application in the background, you can shrink its window to an icon. The icon in the Icon Box becomes bold.

Shrinking a window frees up space on your screen to run other applications. The application continues to run in memory and remains easily accessible, but does not take up any room on your screen. The application's processes continue to execute while the application is stored as an icon.

If the Icon Box contains more icons than can be displayed at once, scroll bars appear.



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To shrink a window to an icon:

1. Point to the window's shrink-to-icon button.
2. Click MB1.

The window closes and its bolded icon appears in the Icon Box.

You cannot shrink the Icon Box to an icon.

When you stop applications, their icons disappear, leaving gaps in your Icon Box. You can rearrange the icons in the Icon Box in two ways:

- Move the icons. To move an icon: point to the icon, press and hold MB1, and drag the icon to a new location.
- Click on the Icon Box's shrink-to-icon button. Unlike a window, the Icon Box does not shrink. Clicking on this button eliminates the gaps between icons.

Expanding Icons to Windows

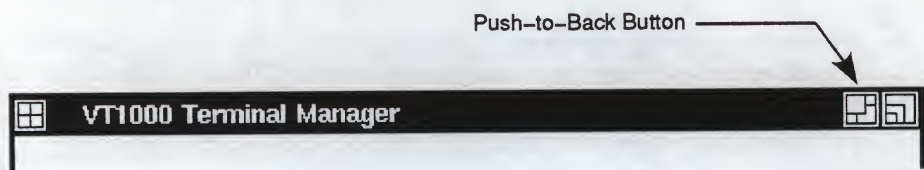
When you expand an application's icon, you open a window for that application. If you already have more than one window open, the new window is placed on top of the stack of overlapping windows. If the window accepts text entry, the window is given input focus.

To expand an icon to a window:

1. Point to the icon in the Icon Box.
2. Click MB1.

Stacking Overlapping Windows

You do not have to move a window to see its entire contents. When windows are overlapping, you can push the top window to the bottom of the stack by clicking on the window's push-to-back button. The next window is then fully visible.



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To push the top window to the bottom of a stack:

1. Point to the top window's push-to-back button.
2. Click MB1.

If you try this repeatedly with three or more windows, you can see that the windows cycle through the stacking order. The lower windows move up one position in the stack each time you move the top window to the bottom of the stack.

Locking Stacked Windows in Place

When you select a window in a stack of windows, that window normally moves to the top of the stack and is given input focus. You can lock the window in place to prevent it from popping to the top of the stack.

For example, suppose you have arranged a stack of windows so that you can see a portion of each window. Perhaps you are using one window to enter commands, so you only need to see a few lines of that window. You may not want the window to pop to the top of the stack each time you select it.

To lock overlapping windows in the stacking order:

1. Point to a window's push-to-back button.
2. Shift click on the button.

That window is pushed to the bottom of the stack.

The lower-right corner of the push-to-back button is filled to indicate that the window is fixed in the stacking order. Although the window is given input focus when you select it, it does not pop to the top of the stack.



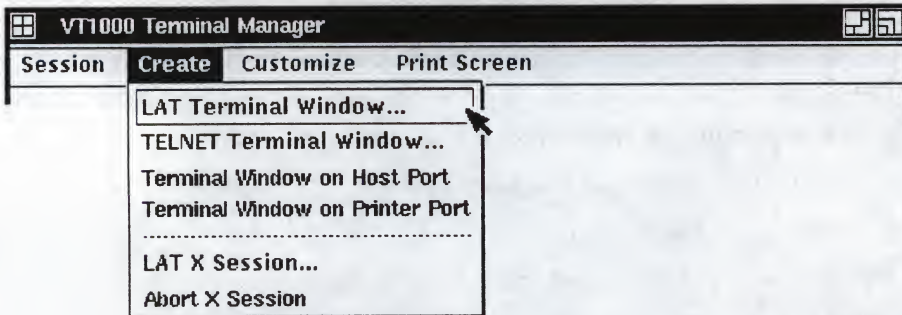
Releasing Windows Locked in the Stacking Order

You can still push a fixed window to the bottom or bring it to the top to see it unobscured. Clicking on a window's filled push-to-back button moves that window to the opposite position in the stack, but does not give it input focus.

- If the window is unobscured, it moves to the bottom of the stack.
- If the window is partially obscured, it moves to the top of the stack.

Choosing Items from Pull-Down Menus

The menu bar of a window lists the names of menus for that application. When you press MB1 on a menu name, the menu is pulled down from the menu bar.



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Some pull-down menus list commands. Others list the names of items you can work with. If a menu item is followed by three periods (. . .), a dialog box will be displayed when you choose that item.

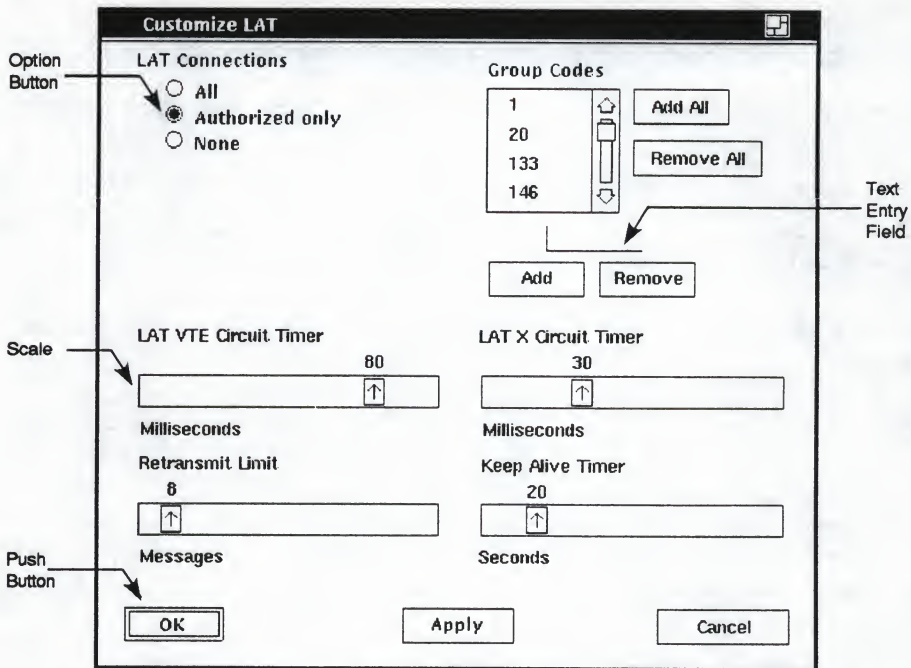
To choose an item from a pull-down menu:

1. On the menu bar, point to the menu name you want to display.
2. Press and hold MB1 to highlight the menu name and pull down the menu.
3. While holding MB1, drag the pointer to the menu item.
4. Release MB1.

If you change your mind while looking at a pull-down menu, drag the pointer outside the menu and release MB1. The menu disappears and no action is taken.

Supplying Information in Dialog Boxes

Windowing applications display a dialog box when they need more information from you to carry out a task. Dialog boxes offer various ways to supply information. In some dialog boxes, you need to enter text. In others, you click MB1 on a button to change a setting. Some dialog boxes display settings you chose earlier.



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Text entry field

A blinking text cursor shows you where the text you type will appear. What you type appears to the left of the text cursor. Use the <X> key to correct typing mistakes.

Option buttons

Clicking on an option button selects one option from a group.

Toggle buttons

Clicking on a square toggle button turns a setting on or off.

Scale

Scales are often used to supply a numeric value. You drag a slider in the scale. The arrow in the slider points to the current value.

Push buttons	Clicking on a rectangular push button (such as OK, Apply, or Dismiss) tells an application what to do with the information you supplied in the dialog box.
Push buttons with double outlines	The double outline indicates a <i>default option</i> . You can choose a default option by simply pressing Return or by clicking on the push button. Default options are those you will choose most frequently. Usually, the OK button is the default option in a dialog box.

Moving and Changing Settings in a Dialog Box

Here are the methods for moving to a text entry field, button, or scale in a dialog box.

To ...	Do this ...
Move forward between text fields.	Press the Tab key, or point to the field you want to move to and click MB1.
Move backward between text fields.	Press the Shift Tab keys, or point to the field you want to move to and click MB1.
Move the text cursor within a text field.	Point to where you want the text inserted and click MB1, or use the right and left arrow keys to move the text cursor right or left. New characters push existing ones to the right.
Change the numeric value on a scale.	Drag the slider left or right on the scale, or point to a location on the scale and click MB1.
Change an option or toggle button setting	Point to the option or toggle button and click MB1.

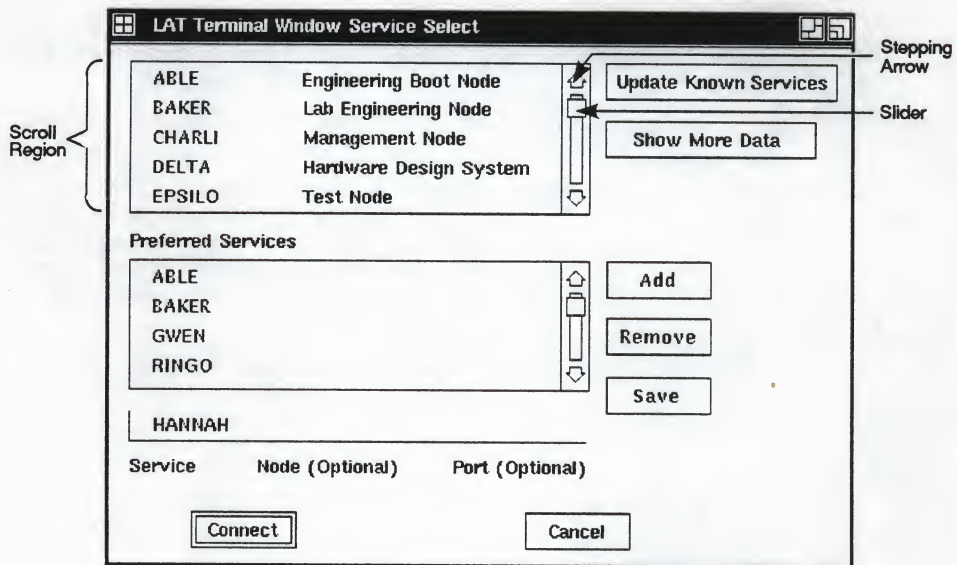
After you change the settings, click on one of the push buttons: OK, Apply, or Cancel.

Click on ...	To ...
OK	Record your choices and dismiss the dialog box.
Apply	Record your choices without dismissing the dialog box.
Cancel	Dismiss the dialog box without changing any settings. If you made any changes without applying them, clicking on the Dismiss button cancels those changes.

Using Scroll Bars

Some windows have *scroll bars* that let you view text that does not fit in the window. Some windows have horizontal and vertical scroll bars.

A scroll bar has *stepping arrows* at either end of the *scroll region*. The *slider* represents your relative position in the file. If the slider is at the top of the scroll region, the beginning of the file or list is visible. If the slider is at the bottom of the scroll region, the end of the file or list is visible.



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The size of the slider tells you how much of the file the window is displaying. If the slider is as large as the scroll region, the complete file is displayed. If the slider is small, only part of the file is displayed. The smaller the slider, the larger the file.

Using scroll bars: You can scroll a line at a time, a window at a time, or to a selected point.

To scroll ...	Do this ...
One line at a time.	Click MB1 on the stepping arrow at either end of the scroll bar.
Forward one window of text at a time.	Point to the scroll region below the slider and click MB1.
Backward one window of text at a time.	Point to the scroll region above the slider and click MB1.
Continuously, one line at a time.	Press and hold MB1 on the stepping arrow at either end of the scroll bar.
Continuously, one window of text at a time.	Press and hold MB1 in the scroll region.
To another location in the list or file.	Drag the slider to a point in the scroll region that you think corresponds to the location you want to see. For example, if the slider is at the top of the scroll region, you are viewing the beginning of the list or file. To cancel the drag, click another mouse button before releasing MB1.

5

Using the VT1000 Terminal Manager

The VT1000 Terminal Manager window appears on the screen at the start of every session. This window acts as a control panel for your current session. The VT1000 Terminal Manager window lets you:

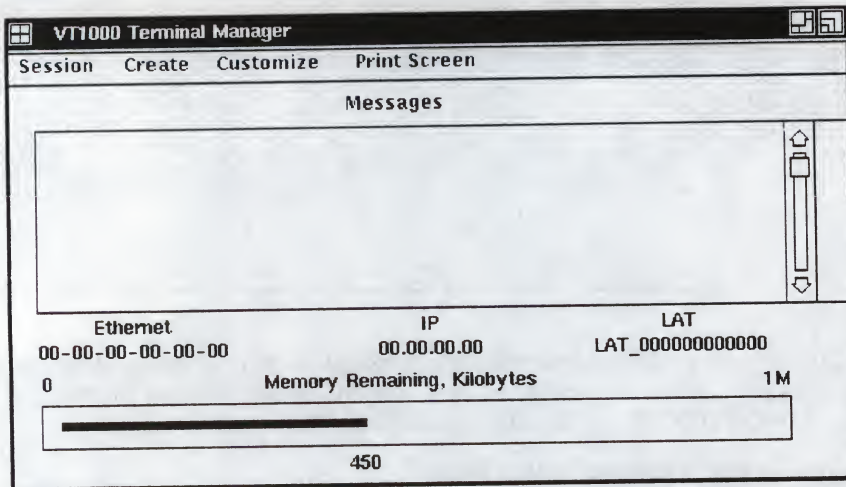
- Create or end a session with a host.
- Customize the terminal's operating features.
- Print the contents of the screen.

The Customize menu in the VT1000 Terminal Manager window lets you check and control the settings for many features—from the keyboard to host communications. For some features, you should select settings to match your host system or application. For others, you can select settings to suit your personal preference. You can make temporary changes for the current session, or you can save the settings for all future sessions.

VT1000 Terminal Manager Window

When you turn on the terminal, the VT1000 Terminal Manager Window appears in the middle of the screen. An Icon Box appears at the top of the screen, and a copyright message at the bottom of the screen. If there are problems when you turn the terminal on, some diagnostic messages may appear under the copyright message.

The VT1000 Terminal Manager window looks like this:



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- The **title bar** appears at the top of the window.
- The **menu bar** displays the names of menus available:

Session	To end a session.
Create	To create a session.
Customize	To customize terminal features.
Print Screen	To print all or part of the screen.
- The **Messages** region displays VT1000 diagnostic or operating status messages.
- The **VT1000 Address** region shows the terminal's Ethernet, IP, and LAT addresses. These addresses define the terminal's location on a network whether you are using TCP/IP or LAT.
- The **Memory Usage** region shows how much of the terminal's random access memory is used up at the moment. This information is a valuable tool that can help application programmers and general users avoid overtaxing the terminal's resources. The scale shows how many kilobytes of free memory are left. The right end of the scale shows how many megabytes of memory the system has: 1M, 2M, 3M, or 4M.

As with any other window, you can change the size of the VT1000 Terminal Manager window by using the resize button. If you save this change (described later in this chapter) then start a new session, the new VT1000 Terminal Manager window appears in the new size.

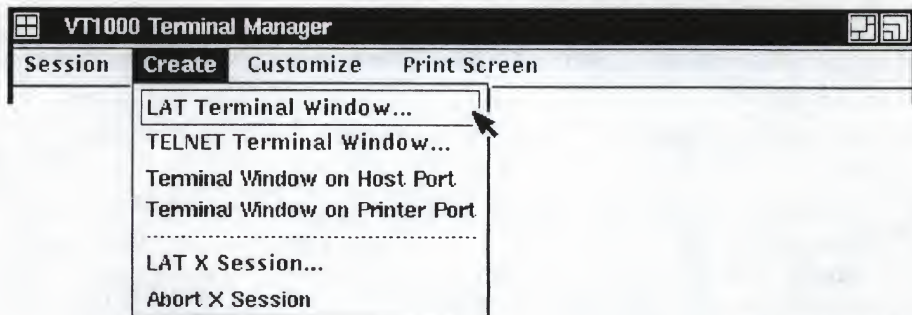
Creating a Connection to the Host

The VT1000 terminal lets you make a connection to a VMS, ULTRIX, or UNIX host system. You can open video terminal window or X window sessions on any of these systems.

Video terminal (VTE) windows let you log in to a host as you would with a conventional video terminal. The VTE windows emulate Digital's VT320 video terminal.

X window sessions let you use X window or DECwindow applications on your host system.

To create connections to your host system, you use the Create menu in the VT1000 Terminal Manager window.



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The following sections describe how to use the Create menu to open host connections.

To open ...	On this system ...	Choose this menu item ...
Video terminal window	VMS	LAT Terminal Window ...
X window	VMS	LAT X

To open ...	On this system ...	Choose this menu item ...
Video terminal window	ULTRIX or UNIX	TELNET Terminal Window ...
X window	ULTRIX or UNIX	TELNET Terminal Window ...
Video terminal window on the serial host port	VMS, ULTRIX, or UNIX	Terminal Window on Host Port ...
Video terminal window on the serial printer port	VMS, ULTRIX, or UNIX	Terminal Window on Printer Port ...

Notes on Opening Windows

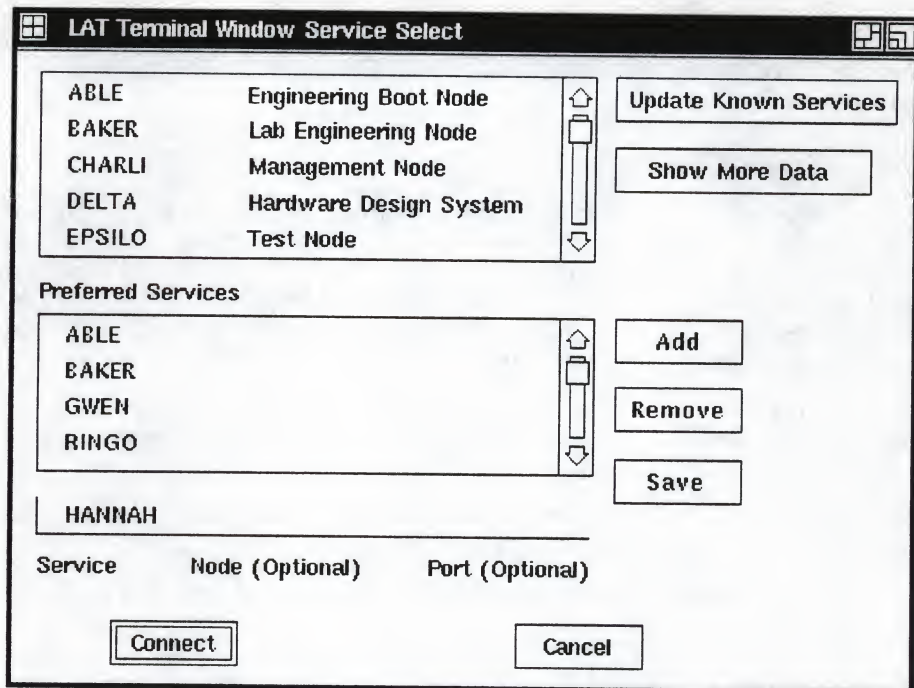
- You can open many LAT or TELNET video terminal windows.
- You can only open one X window session. If you have already opened an X window session, the LAT X Session menu item is dimmed and not selectable.
- You can have several video terminal sessions and one X window session open at the same time.
- You can only open one terminal window for each serial port (host port or printer port). If the host port or printer port is in use, that menu item is dimmed and not selectable. You can select whether the printer port acts as a printer port or an alternate host port in the Customize Printer Port dialog box. The Customize Printer Port dialog box is described later in this chapter.

Opening a Video Terminal Window on a VMS System

To open a video terminal window, you choose the LAT Terminal Window ... menu item from the Create menu. The LAT Terminal Window Service Select dialog box appears. This dialog box provides access to hosts or services on a local area network that supports the local area transport (LAT) protocol. You use this dialog box mainly with the VMS operating system.

The dialog box lists all available hosts and services. You can assign preferred services that you use frequently. After you select a host, a new video terminal window appears. This window lets you access your host through the keyboard as on a conventional video terminal.

The LAT Terminal Window Service Select dialog box looks like this:



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To use this dialog box, you must first enter one or more group codes into the Customize LAT dialog box. If you have not entered any group codes, a message box appears stating that no group codes have been selected. Click on the Acknowledge button in the message box to dismiss the LAT Terminal Window Service Select dialog box and return to the VT1000 Terminal Manager window. The Customize LAT dialog box is described in Chapter 3 and later in this chapter.

Preferred Services

The Preferred Services scroll box lets you enter up to four frequently used host systems or services. A service is an access name assigned to a host system or cluster of hosts. Preferred services represent clusters or host systems that you can immediately select and log into.

You can also enter an optional nodename and port number. A node is an individual computer system on a network. This feature lets you specify a particular node within a service, and a particular port on a server device.

You can also use the other buttons in the dialog box to add or remove selections.

Update Known Services

When you click on the Update Known Services button, the scroll box to the left of the button lists all the services currently accessible on the LAT. If there are many services on the network, the VT1000 may not be able to hold them all in memory at the same time. If this is the case, you or your system manager can arrange group codes. See "Customizing Your VT1000 Environment" later in this chapter.

You can also view all the nodes (as opposed to services) accessible on the LAT. To view the list of nodes, press **[Shift]** and click on the Update Known Services button.

The VT1000 can keep track of 64 known nodes at one time. The terminal keeps the following items in memory:

- Services, nodenames, and/or ports in the Preferred Services scroll box
- Service names stored in the terminal's nonvolatile memory
- Services that have an active connection to the terminal

To start a session on a host:

There are three ways to start a session.

1. Click on one of the four service names in the Preferred Services scroll box. The name appears in the Service Node Port text entry field under the Preferred Services scroll box.
2. Click on the Connect button or press the **[Return]** key on the keyboard.

or

1. Click on a service name in the top scroll box. The name appears in the Service Node Port text entry field under the Preferred Services scroll box.
2. Click on the Connect button or press the **[Return]** key.

or

Double click on a service name in either the top scroll box or in the Preferred Services scroll box. This immediately starts a connection to a host.

To add a new service from the top scroll box to the Preferred Services scroll box:

1. Click on a service name from the top scroll box.
2. Click on the Add button.

There must be an empty space in the Preferred Services scroll box before you can add a new host or service name to the box. Use the Remove button to delete an old host or service name from the box.

To remove a service from the Preferred Services scroll box:

1. Click on the button next to the service you want to remove.
2. Click on the Remove button.

To save the current entries in the Preferred Services scroll box:

Click on the Save button. This saves the list in the terminal's nonvolatile memory. You must perform this step to save any changes you make to the list.

To edit the Preferred Services scroll box:

You can edit entries in the box directly using the mouse and keyboard.

1. Click on the Service Node Port text entry field . A text cursor appears.
2. From the keyboard, type in a new service name. Use the $\langle \text{X} \rangle$ key if you make a mistake.

An entry can be a service name only, a service name and a nodename, or a service name, nodename, and port number. For example, any of the following entries are valid:

```
BETA
BETA_CLUSTER    BETA1
BETA_CLUSTER    BETA1    07
```

3. Click on the Add button. The new service entry appears in the Preferred Services scroll box.

To cancel a selection you have made:

Click on the Cancel button.

To view all accessible services in the the top scroll box:

Click on the Update Known Services button.

You may have to click on this button several times before the service you want appears. Sometimes it takes a few minutes for the terminal to establish communication with some services on the network.

To view all accessible nodes in the top scroll box:

Press **[Shift]** and click on the Update Known Services button.

To display more technical data about a host or service:

1. Click on one of the services in the top scroll box or in the Preferred Services scroll box.
2. Click on the Show More Data button. All the data known about the selected host or service appears in the Preferred Services scroll box.

Opening an X Window Session on a VMS System

To open an X window session, you choose the LAT X Session . . . menu item. The LAT X Session Service Select dialog box appears. The dialog box lets you start an X window or DECwindows session on a selected VMS host. After you select a host, the VT1000 begins a windowing session on that host.

This dialog box is identical to the LAT Terminal Window Service Select dialog box, except for the title bar. For a description, see "Opening a Video Terminal Window on a VMS System" in this chapter.

Aborting an X Window Session

To abort an X window or DECwindows session in progress, choose the Abort X Session menu item from the Create menu. You can only select Abort X Session when there is a windowing session in progress. Otherwise, this menu item is dimmed and not selectable.

Opening a Video Terminal Window or X Window Session on an ULTRIX or UNIX System

To open a video terminal window or X window session, you use the TELNET Terminal Window . . . menu item. When you select this item, the TELNET Terminal Window Service Select dialog box appears.

This dialog box provides access to hosts on a wide area network that supports the transmission control program/Internet protocol (TCP/IP). You use this dialog box mainly with the UNIX or ULTRIX operating system. The TELNET Terminal Window Service Select dialog box looks like this:

TELNET Terminal Window Service Select

IP Address and/or Host Name

☐
☐
☐
☐

Save Remove

Connect Cancel

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IP Address and/or Host Name

In the TCP/IP communication protocol, the terminal uses an IP address to access a specific host computer on the network. You use the IP Address and/or Host Name list to enter IP addresses and optional host names. The terminal can save IP addresses and host names in nonvolatile memory.

You can enter a host IP address in one of five formats:

Format	Example
Decimal dot notation	123.45.67.89
Decimal whole number	2066563929
Hexadecimal	0x762d4359
Octal dot notation	0173.55.103.131
Octal whole number	017313241531

For TELNET communications, you can append a TELNET port number preceded by a comma. For example, if you appended port number 23 to the decimal dot address above, the address would be 123.45.67.89,23. You may only specify nonprivileged port numbers.

TCP/IP addresses and host names are limited to 30 characters. You can save up to four addresses in nonvolatile memory.

To connect to a host:

1. Click on the button next to the IP address you want to connect to.
2. Click on the Connect button or press the **Return** key.

To remove an IP address from the list:

1. Click on the button next to the IP address you want to remove.
2. Click on the Remove button.

To save the current list of IP addresses:

Click on the Save button to save the list in nonvolatile memory. You must perform this step to save any changes you made to the list.

To edit your list of IP addresses:

You can edit the list directly using the mouse and keyboard. Simply click on the space of the IP address you want to change, then type in the new address. IP addresses are limited to 30 characters. Use the **<X>** key if you make a mistake.

For your convenience, you may include a host name with the host's IP address in the list as follows:

```
123.45.67.89 HOST_NAME
```

The terminal ignores the host name.

To cancel a selection you have made:

Click on the Cancel button.

Aborting an X Window Session

To abort an X window or DECwindows session in progress, choose the Abort X Session menu item from the Create menu. You can only select Abort X Session when there is a windowing session in progress. Otherwise, this menu item is dimmed and not selectable.

Opening a Video Terminal Window on the Host or Printer Port (VMS, ULTRIX, or UNIX)

To open a video terminal window on the host port or video port, you choose one of the following menu items:

Terminal Window on Host Port

Lets you connect to a host through the host serial communication port. This port uses a 6-pin, DEC-423 connector on the rear of the system box.

Terminal Window on Printer Port

Lets you connect to a host through the printer port. This port uses the 6-pin, DEC-423 serial printer connector on the rear of the system box. Before you can open a terminal window on the printer port, you must set the printer port to work as an alternate host port. See the Customize Printer Port dialog box section in this chapter. If you do not set the printer port to work as a host port, the Terminal Window on Printer Port menu item is dimmed and not selectable.

Ending a Session

You can end a session at any time. When you end a session, the VT1000:

- Ends all host connections.
- Clears the screen of all windows.
- Performs a complete software reset.
- Displays the VT1000 Terminal Manager.

To end your session:

1. Pull down the Session menu from the VT1000 Terminal Manager's menu bar.
2. Click on the Quit menu item. A prompt box appears that asks you if you really want to end the session.
 - To end the session, click on Yes.
 - To remain in the session, click on No.

If you made changes in the Customize menu and have not saved the changes, another prompt box appears in place of the end-session prompt box. This prompt box tells you that you have changed some settings in the Customize menu without saving them and asks if you would like to save them.

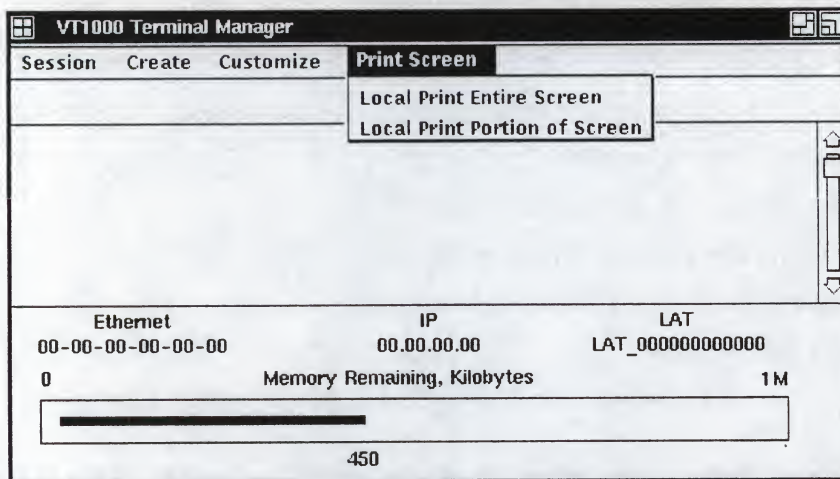
If you select . . . The terminal . . .

Yes	Saves the current settings before performing a restart operation.
-----	---

No	Immediately quits the session without saving your changes.
Cancel	Does not quit the session. You can resume working in that session.

Printing the Screen

The Print Screen menu in the VT1000 Terminal Manager window lets you print all or part of the screen display on a local printer connected to the rear of the terminal. For more information about printing, see Chapter 9.



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If you are currently using the printer port as a second host port, the print screen selections in the menu are dimmed and not available.

The VT1000 terminal encodes the screen image into units called sixels, then sends the encoded image to the local printer. A sixel is a vertical column of six pixels. *Pixels*, or picture elements, are the smallest displayable unit on a video screen.

The VT1000 supports level 1 and level 2 Digital printers. Level 1 printers include the LA50 dot matrix printer. Level 2 printers include the LA75 dot matrix printer and the LN03 laser printer.

To print the complete screen image:

Choose the Local Print Entire Screen menu item.

To print a portion of the screen image:

1. Choose the Local Print Portion of Screen menu item. The pointer turns into a cross.
2. Hold down MB1, then drag the pointer across the portion of the screen you want to print. As you drag the pointer, a rectangle forms around the portion of the screen.
3. Release MB1 to send the image to the printer.

Customizing Your VT1000 Environment

The VT1000 terminal has many preset operating features that you can change. Initially, the features use factory-default settings that work with many host systems. If needed, you can customize some settings to suit your particular computing environment and working style.

To access the terminal's operating features, you use the Customize menu in the VT1000 Terminal Manager window. You can look at the current settings of features, change them, and save the new settings. The following sections describe the Customize menu items.

There are three other ways to customize certain features of your VT1000 terminal:

- **VTE Customize menu**

When you open a video terminal window, you can choose another Customize menu. This menu lets you change certain video terminal window features while an application is running. Most of the time, the application handles customization of the video terminal window. Chapter 6 describes how to use the video terminal (VTE) window.

- **Host-based control functions**

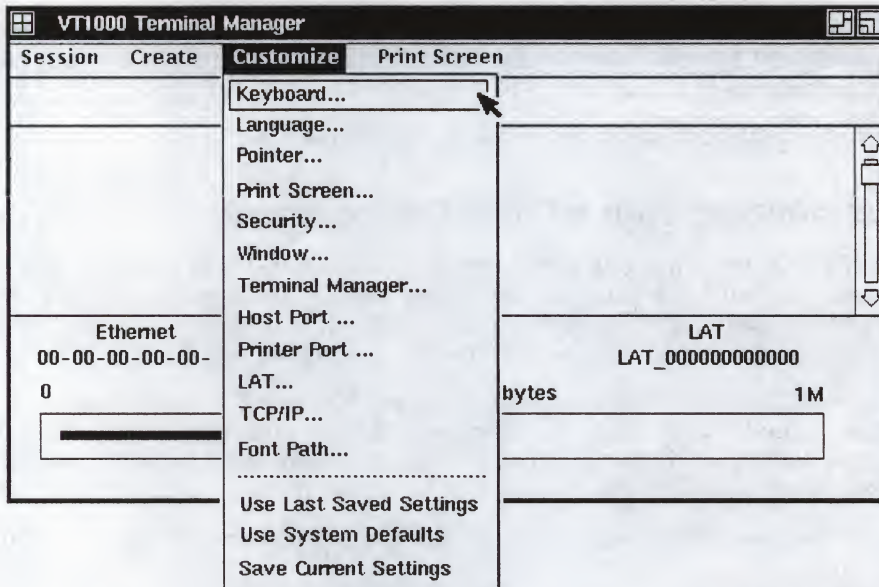
Applications can control many VT1000 features from the host by using control functions. Chapter 10 is a summary of all the control functions that control the video terminal window.

- **Client Customize**

The X window or DECwindows software package includes its own Customize utility, not described here. For more information on the DECwindows Customize utility, see the *VMS DECwindows User's Guide*.

Displaying the Customize Menu

You pull down the Customize menu from the VT1000 Terminal Manager's menu bar. The Customize menu looks like this:



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When you choose a menu item from the menu, the dialog box for that item appears. Shaded buttons indicate the current settings. You can examine the settings and change them if necessary. After you make changes in a dialog box, you can record your settings or dismiss the dialog box.

When you record your settings, the new settings take effect for that session only. To use the new settings for all future sessions, you must save the settings in nonvolatile memory. See "Saving and Recalling Settings" in this chapter.

Each dialog box has three push buttons for recording or dismissing new settings:

Click on ...	To ...
OK	Record new settings and dismiss the dialog box.
Apply	Record new settings without dismissing the dialog box.
Cancel	Dismiss the dialog box without changing any settings. If you made any changes without applying them, clicking on the Cancel button cancels those changes.

Saving and Recalling Settings

If you make changes to settings, you can save them for use in all future sessions. If you do not save your new settings, they are lost when you end your current session.

If you make temporary changes to settings, you can recall the factory-default settings or the last settings you saved.

To save or recall settings, use the following menu items from the Customize menu:

Choose ...	To ...
Use Last Saved Settings	Recall the last settings you saved. Choose this menu item if you want to reset any features that you changed temporarily, but did not save.
Use System Defaults	Recall the VT1000 factory-default settings from read-only memory and from the host system defaults, if available.
Save Current Settings	Save the settings you just changed, so you can use them in all future sessions.

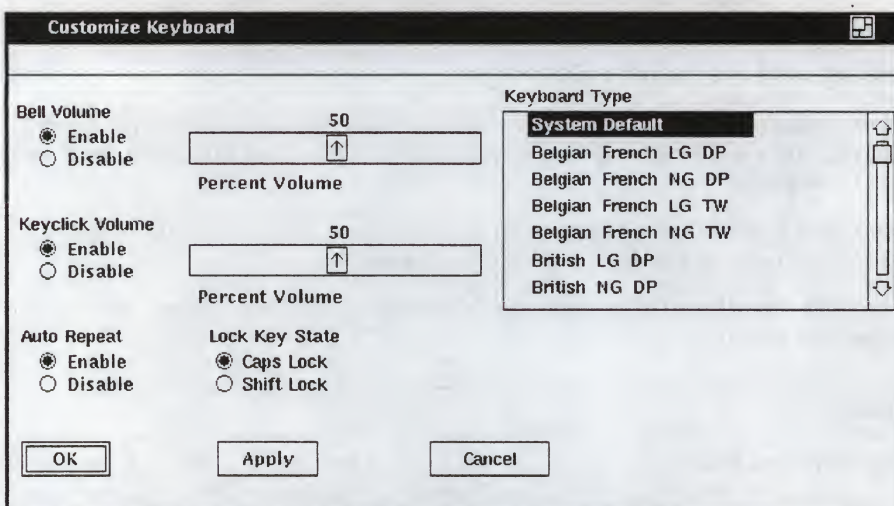
Some new settings do not take effect until you end your current session and begin another one.

Changing Your Keyboard Settings

To change your keyboard settings, choose the Keyboard . . . menu item from the Customize menu. The Customize Keyboard dialog box appears:

NOTE

You can also customize keyboard settings for individual VTE windows. See Chapter 6.



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From the Customize Keyboard dialog box, you can change any of the following settings:

Bell Volume

A warning bell sounds to alert you to system messages. You can adjust the bell volume by dragging the arrow in the Percent Volume slider to the right or left. You can also adjust the bell volume by moving the pointer to a location on the slider and clicking MB1. To disable the bell, click on the Disable button.

Default: Enable

Keyclick Volume

Each time you press a keyboard key, the keyboard makes a clicking sound. You can adjust the keyclick volume by dragging the arrow in the Percent Volume slider right or left. You can also adjust the keyclick volume by moving the pointer to a location on the slider and clicking MB1. To disable keyclicks, click on the Disable button.

Default: Enable

Auto Repeat

When you press a key longer than normal, it repeats until you release it. To disable the auto repeat feature, click on the Disable button.

Default: Enable

Lock Key State

Normally when you press the lock key on the keyboard, the alphabetic keys send uppercase letters but the number keys do not send their shifted character.

When you click on the Shift Lock button, all keys send their shifted character.

Default: Caps Lock

Keyboard Type

Default: North American

The VT1000 keyboard comes in different models for different languages and dialects. The location of some characters varies depending on the keyboard model. Make sure the keyboard type matches your keyboard model, so the system sends the correct character when you press the corresponding key. Appendix F shows all the keyboard models available.

The default keyboard type is North American. If you have any other keyboard model, you must select the correct keyboard type when the terminal is installed.

To find your keyboard model number: Turn the keyboard upside down and look for a label that specifies the model number. The model number should be in a format similar to LK401-xx or nn-nnnnn-xx. Use the xx value to choose your keyboard type from the Keyboard Type scroll box.

For example, if you have a Belgian French keyboard and the model number is LK401-NG, you choose either Belgian French NG DP or Belgian French NG TW. The DP and TW designations select either the data processing or typewriter characters on the keyboard. (See Chapter 5 for details.)

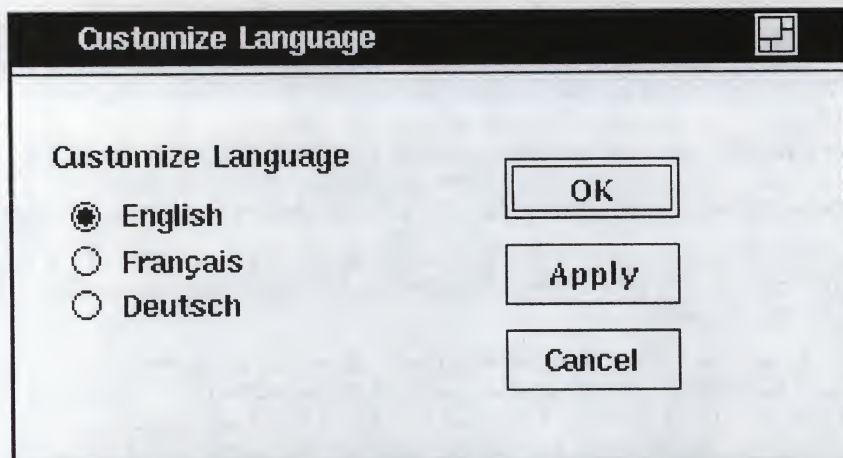
Typewriter or data processing keys: For any keyboard dialect other than North American, you can specify whether you want your keyboard to act as a typewriter (TW) or data processing (DP) keyboard. This setting affects keys with three or more characters. Selecting a data processing keyboard sends the characters on the right half of the keycaps. Selecting a typewriter keyboard sends the characters on the left half of the keycaps.

To use this new keyboard type for all future sessions, save the new setting before you end the current session. See "Saving and Recalling Settings" in this chapter.

Choosing the Display Language

Default: English

The VT1000 Terminal Manager supports three languages: English, French, and German. After you apply your selection, the terminal displays text in the language you selected. To change your display language setting, choose the Language . . . menu item from the Customize menu. The Customize Language dialog box appears:

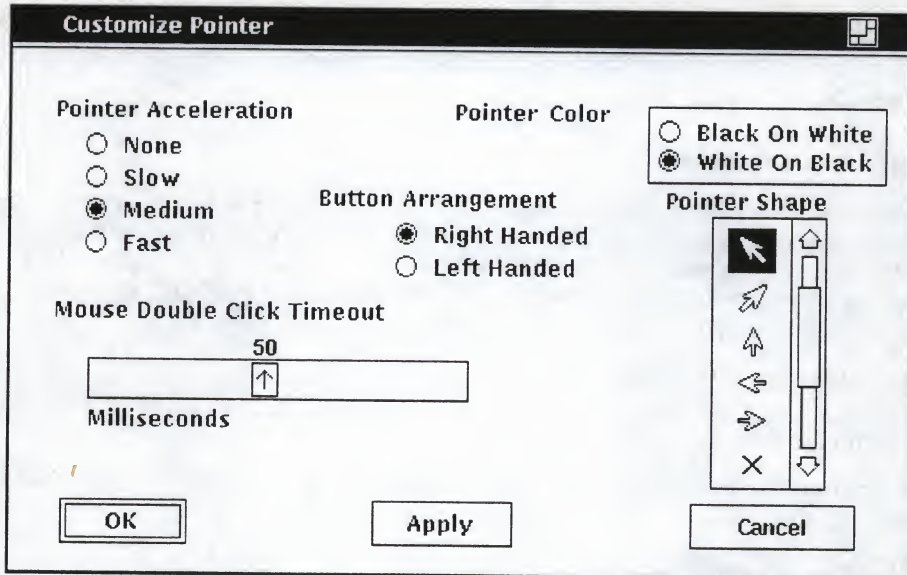


To select a language, click on the appropriate button.

The selected language only applies to the VT1000 terminal locally. There may be times when your host application has a different setting than your terminal.

Changing Your Pointer and Mouse Settings

You can change the shape and color of the pointer, as well as certain mouse features. To change your mouse and pointer settings, choose the Pointer . . . menu item from the VT1000 Terminal Manager's Customize menu. The Customize Pointer dialog box on your monochrome VT1000 terminal looks like this:



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From the Customize Pointer dialog box, you can change any of the following settings:

Pointer Acceleration

Click on one of the four options to vary the rate at which the pointer moves in relation to the mouse. The None setting keeps the pointer speed constant. The Fast setting makes the pointer move farther when you move the mouse faster. This lets you move the pointer to another part of the screen without moving the mouse the same relative distance.

Default: Medium

Pointer Color

The pointer consists of an outline and filled center. On your monochrome VT1000 terminal, the pointer's filled area is normally white with a black outline. To reverse the fill and outline colors, click on the Black on White button. To see your changes, click on the Apply or OK button in the dialog box.

Default: White on Black

Button Arrangement

The default mouse button arrangement is natural for a right-handed user—MB1 on the left of the mouse and MB3 on the right. If you are left-handed, you can click on the Left Handed button. This makes MB1 the right mouse button and MB3 the left mouse button. MB2 is always the middle button.

Default: Right Handed

Pointer Shape

To change the pointer shape, scroll through the list of shapes and select the one you want.

Default: left arrow

Mouse Double Click Timeout

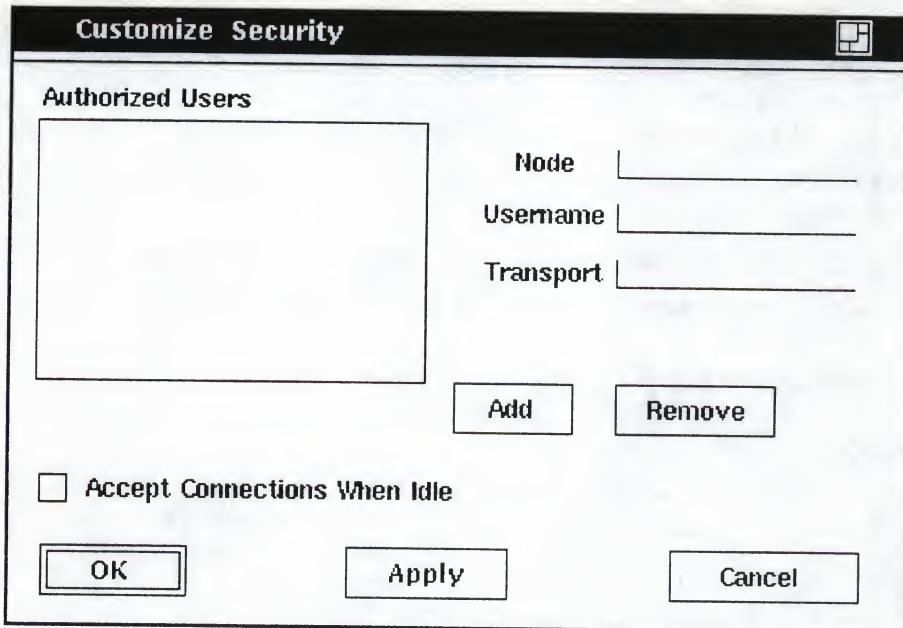
The VT1000 terminal can tell two single clicks from a double click, based on the speed at which buttons are clicked. To change the time allowed for making the second click in a double-click sequence, drag the arrow in the slider to the right or left, or move the pointer to a location on the slider and click MB1.

Changing Your Security Settings

Your VT1000 terminal can run applications on most VMS, ULTRIX, and UNIX host systems that use standard networking software—LAT for VMS, TCP/IP for ULTRIX or UNIX.

- When you make a TCP/IP connection to a host, the terminal accepts connections from any host you have connected to using TCP/IP.
- When you make a LAT connection to a host, the terminal accepts connections from any host you have connected to using LAT, provided that the application is running under your username.

You can explicitly authorize other users to connect to your VT1000 terminal. Choose the Security . . . menu item from the VT1000 Terminal Manager's Customize menu to display the Customize Security dialog box:



The image shows a dialog box titled "Customize Security". It has a standard window title bar with a maximize button. The dialog is divided into two main sections. The top section, titled "Authorized Users", contains a large empty rectangular box on the left and three input fields on the right labeled "Node", "Username", and "Transport". Below the "Authorized Users" section are two buttons: "Add" and "Remove". At the bottom of the dialog is a checkbox labeled "Accept Connections When Idle". Below the checkbox are three buttons: "OK", "Apply", and "Cancel".

Customize Security

Authorized Users

Node

Username

Transport

☐ Accept Connections When Idle

GSF_1050_89.RAGS

You can maintain a list of four authorized users. These users have immediate access to your VT1000 terminal. The VT1000 stores the nodenames, usernames, and transports (LAT or TCP/IP) of these users, in nonvolatile memory.

To allow all hosts or none to make connections, you can use the Customize LAT or Customize TCP/IP dialog boxes described in this chapter. See "Changing Your LAT Settings (VMS Systems)" or "Changing Your TCP/IP Settings (ULTRIX and UNIX Systems)".

Adding or Removing an Authorized User

NOTE

The TCP/IP protocol does not track usernames, so you cannot authorize individual users when accepting TCP/IP connections. If the node is an approved IP address, the VT1000 accepts any connections from that node.

To add an authorized user into the Authorized Users box:

1. Click on the Node text entry field. Enter a nodename or IP address. For example: DELTA or 123.45.67.89
2. Click on the Username text entry field. Enter a username. For example: Smith
3. Click on the Transport text entry field. Enter LAT or TCP/IP, depending on the communication protocol you are using.
4. Click on the Add button. The new authorized user appears in the Authorized Users box.

To remove an authorized user from the Authorized Users box:

1. In the Authorized Users box, click on the username of the user you want to remove.
2. Click on the Remove button.

Accept Connections When Idle

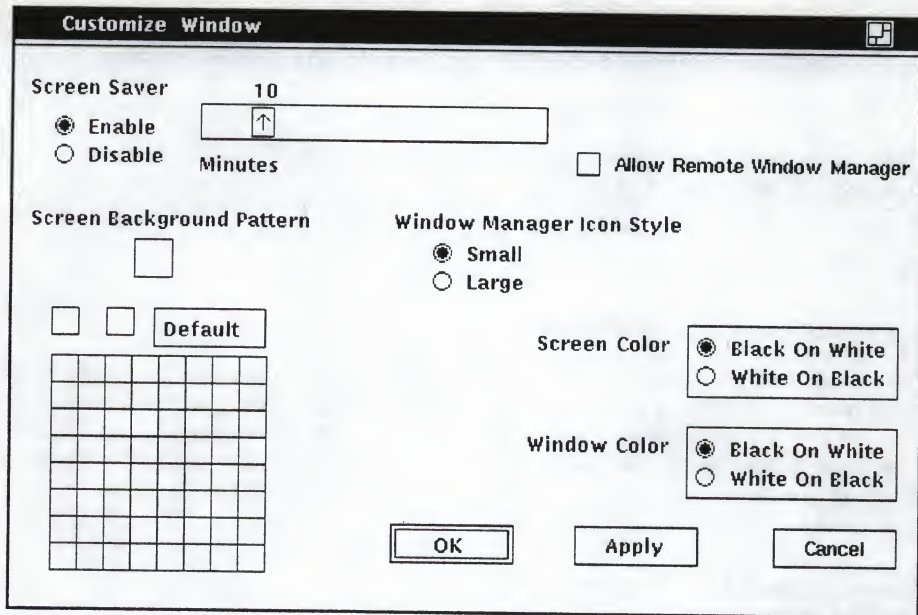
Your VT1000 terminal has the ability to accept connections from authorized host systems, even though you have not started a DECwindows or X window session on the terminal. This lets your terminal act as a slave display device requiring no active intervention. To enable this feature, click on the Accept Connections When Idle button. This allows the terminal to accept X window and DECwindows connections when idle.

NOTE

For desktop units where people frequently log in, accepting connections when idle may be a security risk. Digital recommends that you leave this feature off for desktop units.

Changing Your Window Settings

You can change the look of your VT1000 window display. For example, you can change the background pattern, window color, and screen color. To change your window settings, choose the Window . . . menu item from the VT1000 Terminal Manager's Customize menu. The Customize Window dialog box looks like this:



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Some changes take effect when you click on the Apply button or OK button in the Customize Window dialog box. Others take effect in your next session. See the individual features for details.

From the Customize Window dialog box, you can change any of the following settings:

Screen Saver

The Screen Saver extends the life of your monitor by shutting off its display after a specified time. Normally, the terminal shuts off its display after 10 minutes of keyboard or mouse inactivity. You can vary the time before the screen goes blank from 1 to 60 minutes.

- To vary the time the screen saver waits before shutting down the display, drag the arrow in the slider to the right of left, or move the pointer to a spot on the slider and click MB1.
- To keep the display on indefinitely, click on the Disable button.
- Click on the Apply button or OK button to apply your change.

You can check if the screen saver is on by looking at the keyboard indicator lights. The lights blink in a regular pattern when the screen saver is on.

Default: 10 minutes

Allow Remote Window Manager

You can select whether or not a host-based window manager can take over windowing operations on the screen. The VT1000's local window manager provides you with quicker response time and overall higher performance. However, a host-based window manager may offer more features. To let the host control windowing operations, click on the Allow Remote Window Manager button

Screen Background Pattern

Normally, the screen background pattern is a tight, gray crossweave. To change the background pattern, click on a pattern in the pattern palette. The pattern you select appears in the pattern viewer. Click on the Apply or OK button to see your selection in effect.

You can also create a solid background by clicking on one of two background pattern buttons next to the Default button.

- Click on the left button to create a solid background in the screen foreground color. For example, if the Screen Color is Black on White on your monochrome system, click on the left button in the Screen Background Pattern to see a solid black background.
- Click on the middle button to create a solid background in the screen background color.

Default: Gray crossweave

Window Manager Icon Style

Normally, the icons stored in the Icon Box are small. Click on the Large button to change the size of the icons. If you save your changes, the Icon Box will contain large icons when you start your next session.

Default: Small

Screen Color

The screen pattern, when set to anything other than the default pattern, consists of a screen foreground (the filled area in the pattern) and a screen background (the pattern's outline).

On your monochrome VT1000 terminal, the screen color is normally black. Click on the White on Black option button to reverse the fill and outline colors.

To see your new setting in effect, click on the Apply button or OK button.

Default: Black on White

Window Color

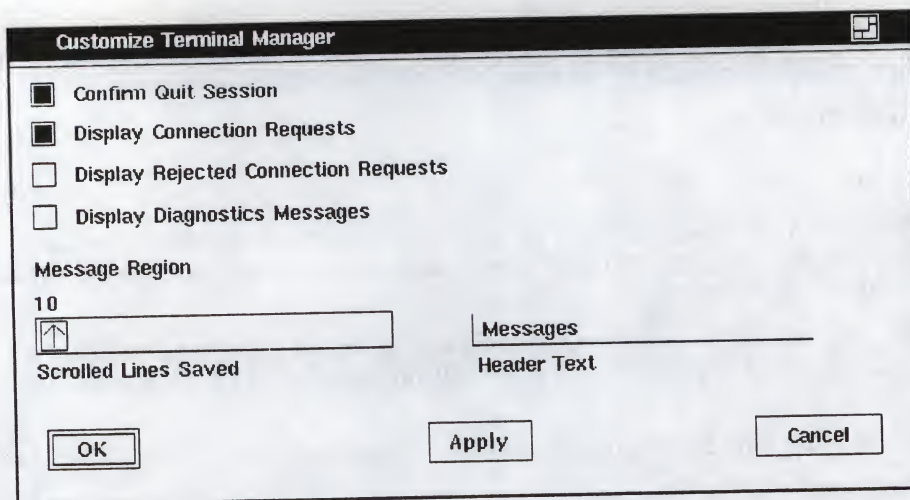
The Window Color setting controls the color of text or graphics in a window. On your monochrome VT1000 terminal, the window color is normally black. Click on the White On Black button to change the window color to white.

If you save your changes by clicking on the Apply button or OK button, your new setting takes effect when you start your next session.

Default: Black on White

Controlling the Display of Messages

You can choose whether or not to have the terminal display certain messages, such as connection requests. You can choose settings that suit your preference or the needs of your application software. Messages appear in the Messages region of the VT1000 Terminal Manager Window. Choose the Terminal Manager... menu item from the VT1000 Terminal Manager's Customize menu. The Customize Terminal Manager dialog box looks like this:



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From the Customize Terminal Manager dialog box, you can change any of the following settings:

Confirm Quit Session

When you quit a session from the Session menu, the terminal normally asks for confirmation. You can turn this feature on or off by clicking on the Confirm Quit Session toggle button. If you turn this feature off, the terminal ends the current session immediately after you choose Quit from the Session menu.

Default: enabled

Display Connection Requests

The terminal normally displays connection requests in the Messages region. You can turn this feature on or off by clicking on the Display Connection Requests toggle button.

Default: enabled

Display Rejected Connection Requests

Normally, the terminal does not display rejected connection requests. You can choose to have the terminal display the rejection messages in the Messages region. To turn this feature on or off, click on the Display Rejected Connection Requests toggle button.

Default: enabled

Display Diagnostics Messages

Diagnostic messages indicate any problem with the network server or VT1000 terminal. Normally, the terminal does not display these messages. You can choose to have the terminal display the diagnostic messages in the Messages region. To turn this feature on or off click on the Display Diagnostic Messages toggle button.

Default: enabled

Messages Region

You can scroll through text in the Messages region. The Scroll Lines Saved slider lets you specify how many lines scrolled out of the region to save. Any extra lines are lost.

This feature does not affect the size of the Messages region. The size of the message region depends on how big you make the VT1000 Terminal Manager window.

Header Text

You can specify the text of the header the terminal uses for the Messages region. Just click on the Header Text field, then enter your header. The message header can have up to 30 characters.

Default: Messages

Changing Your Host Port or Printer Port Settings

You can specify the communication settings of the terminal's serial host and printer ports to make them compatible with your host system. The default settings work with most Digital systems. Make sure the settings you use match your host system.

The host port is for connecting to a host system. The printer port is for connecting a local printer to the VT1000 terminal. You can also use the printer port as an extra host port, to connect to a second host. Each port uses a DEC-423, 6-pin connector.

NOTE

You cannot use X windows or DECwindows over the host or printer port. These ports are for traditional terminal communication with host systems. You must use the Ethernet connector to use X windows or DECwindows.

The Customize Host Port and Customize Printer Port dialog boxes are identical, except for a few extra buttons in the Customize Printer Port dialog box.

To change the host port settings, choose the Host Port... menu item from the VT1000 Terminal Manager's Customize menu. The Customize Host Port dialog box looks like this:

Transmit	Receive	Word Size	Stop Bits
<input type="radio"/> 300	<input type="radio"/> 300	<input checked="" type="radio"/> 8-bit	<input checked="" type="radio"/> One
<input type="radio"/> 600	<input type="radio"/> 600	<input type="radio"/> 7-bit	<input type="radio"/> Two
<input type="radio"/> 1200	<input type="radio"/> 1200		
<input type="radio"/> 2400	<input type="radio"/> 2400	Parity	XOFF at
<input type="radio"/> 4800	<input type="radio"/> 4800	<input checked="" type="radio"/> None	<input checked="" type="radio"/> 64
<input checked="" type="radio"/> 9600	<input type="radio"/> 9600	<input type="radio"/> Even	<input type="radio"/> 128
<input type="radio"/> 19.2k	<input type="radio"/> 19.2k	<input type="radio"/> Odd	<input type="radio"/> No XOFF
<input type="radio"/> 38.4k	<input type="radio"/> 38.4k		
	<input checked="" type="radio"/> rx = tx		

OK Apply Cancel

To change the printer port settings, choose the Printer Port... menu item from the VT1000 Terminal Manager's Customize menu. The Customize Printer Port dialog box looks like this:

Transmit	Receive	Word Size	Stop Bits
<input type="radio"/> 300	<input type="radio"/> 300	<input checked="" type="radio"/> 8-bit	<input checked="" type="radio"/> One
<input type="radio"/> 600	<input type="radio"/> 600	<input type="radio"/> 7-bit	<input type="radio"/> Two
<input type="radio"/> 1200	<input type="radio"/> 1200		
<input type="radio"/> 2400	<input type="radio"/> 2400	Parity	XOFF at
<input type="radio"/> 4800	<input type="radio"/> 4800	<input checked="" type="radio"/> None	<input checked="" type="radio"/> 64
<input checked="" type="radio"/> 9600	<input type="radio"/> 9600	<input type="radio"/> Even	<input type="radio"/> 128
<input type="radio"/> 19.2k	<input type="radio"/> 19.2k	<input type="radio"/> Odd	<input type="radio"/> No XOFF
<input type="radio"/> 38.4k	<input type="radio"/> 38.4k		
	<input checked="" type="radio"/> rx = tx	<input type="radio"/> Host Port	
		<input checked="" type="radio"/> Printer Port	
		<input type="radio"/> 2-Way Printer Port	
		<input type="radio"/> Diagnostics Port	

OK Apply Cancel

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From the Customize Host or Printer Port dialog box, you can change any of the following settings:

Transmit

You can select the speed the terminal uses to send data to the host system or printer. Normally, the terminal uses a speed of 9600. This setting works with most Digital systems. To select another speed, click on the button next to the speed you want.

The VT1000 terminal does not support speeds lower than 300.

Default: 9600

Receive

You can select the speed the terminal uses to receive data from the host system or printer. Normally, the terminal's receive speed matches its transmit speed (rx = tx). However, the terminal can transmit at one speed and receive at another. To select another speed, click on the button next to the speed you want. Make sure you select a receive speed that matches your host's or printer's transmit speed.

Default: rx = tx

Word Size

You can select the character format used to communicate with the host system or printer. The terminal uses a default word size of 8 bits. This setting works with most of today's computer systems. For 7-bit environments, click on the 7-bit button.

Default: 8-bit

Stop Bits

You can select the number of stop bits used in the character format. Digital recommends using one stop bit for most applications. To select two stop bits, click on the two button.

Default: One

Parity

You can select the number of parity bits used for error checking when communicating with a host or printer. The terminal uses a default setting of no parity (none). To select even or odd parity, click on the even or odd button.

Default: None

XOFF At

You can select how many characters the terminal stores in its receive buffer before sending the host or printer an XOFF signal to stop sending data. Normally, the terminal sends XOFF to the host when the input buffer contains 64 characters. See Appendix C for details. To select 128 or no XOFF, click on the appropriate button.

Default: 64

Using the Printer Port (Printer Port Dialog Box Only)

Normally, the printer port acts as a printer port. When you use this setting, you can connect a local printer to the terminal for print screen operations. You can choose one of four functions for the printer port:

- Second host port
- Printer port
- Bidirectional printer port
- Diagnostics port

Choose ...	To ...
Host Port	Use the printer port to connect the terminal to a second host system.
Printer Port	Use the printer port to connect a local printer.
2-Way Printer Port	Let the printer send control information to the host.
Diagnostics Port	Let the terminal send diagnostic messages out of the printer port.

To select the Host Port, 2-Way Printer Port, or Diagnostics Port settings, click on the appropriate button.

Default: Printer Port

Changing Your LAT Settings (VMS Systems)

VMS systems use the local area transport (LAT) protocol to connect to the terminal. You can control the list of hosts and services that can connect to your VT1000 terminal. The terminal uses LAT group codes to identify hosts and services. The terminal can store 255 group codes. Your system manager can also adjust the performance of LAT connections.

To change LAT settings and adjust performance, choose the LAT... menu item from the VT1000 Terminal Manager's Customize menu. The Customize LAT dialog box looks like this:

Customize LAT

LAT Connections

☐ All
☒ Authorized only
☐ None

Group Codes

1
20
133
146

Add All
Remove All

Add Remove

LAT VTE Circuit Timer

80

Milliseconds

Retransmit Limit

8

Messages

LAT X Circuit Timer

30

Milliseconds

Keep Alive Timer

20

Seconds

OK Apply Cancel

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From the Customize LAT dialog box, you can change any of the following settings:

LAT Connections

Normally, only authorized hosts can make connections to the terminal. You specify which hosts are authorized by using the Customize Security dialog box. To allow all hosts or none to make connections, click on the appropriate button.

Default: Authorized only

Group Codes

The Group Codes scroll box lets you maintain groups of hosts or services that you want to access. Group codes let you specify a group of hosts or services with a single number code. The terminal uses group codes to identify and communicate with hosts on the network. If you are unfamiliar with using group codes, see your system manager.

To add a new group code:

1. Click on the text entry field under the Group Codes scroll box, then enter the new code.
2. Click on the Add button. The terminal enters the new code in the scroll box.

To remove a group code from the list:

1. In the scroll box, click on the group code you want to remove.
2. Click on the Remove button.

To enable all the group codes on your network:

Click on the Add All button to enable the terminal to use all group codes on your network. Remember that the terminal can store a limit of 255 group codes. You should only use this feature if your network has a low number of group codes.

To remove all the group codes from the scroll box:

Click on the Remove All button.

LAT Slide Bars (For System Managers)

You can fine tune the characteristics of your LAT environment by adjusting the four slide bars provided in the Customize LAT dialog box.

See your system manager for the optimal settings of these slide bars. They directly affect the performance of your local area network and should only be adjusted by system management personnel. The slide bars are *not* intended to be randomly set according to the preference of individual users. Poor adjustments can produce poor network and VT1000 terminal performance.

There are four slide bars:

LAT VTE Circuit Timer

You set the LAT VTE Circuit Timer to tune the network for the best response time and network performance when running video terminal (VTE) windows. The optimum setting depends on the number of users

on the local area network and the typical network traffic conditions. The normal setting of 80 milliseconds works well with most Digital systems.

Default: 80 milliseconds

LAT X Circuit Timer

You set the LAT X Circuit Timer to tune the network for the best response time and network performance when running an X window or DECwindows session. The optimum setting depends on the number of users on the local area network and the typical network traffic conditions. The normal setting of 30 milliseconds works well with most Digital systems.

Default: 30 milliseconds

Retransmit Limit

To make a LAT connection to a host system, the terminal sends out a request-to-connect message then waits for an acknowledgement. If the host does not acknowledge the request, the terminal resends the message a specified number of times. The Retransmit Limit tells the terminal how many times to resend the message. If the terminal does not receive an acknowledgement after sending the message the specified number of times, the terminal stops requesting a connection and indicates it could not connect to that host.

Normally, the terminal resends the message eight times before it stops trying to connect. This setting works well with most Digital systems.

Default: 8 times

Keep Alive Timer

When the terminal is inactive, it sends certain LAT messages out on the network every few seconds to keep the LAT connection alive. Normally, the terminal sends messages out every 20 seconds. This setting works well with most Digital systems.

Default: 20 seconds

Changing Your TCP/IP Settings (ULTRIX and UNIX Systems)

ULTRIX and UNIX systems use the TCP/IP protocol to connect to the VT1000 terminal. You can control which hosts and services can connect to the terminal. Choose the TCP/IP... menu item from the VT1000 Terminal Manager's Customize menu. The Customize TCP/IP dialog box looks like this:

Customize TCP/IP

TCP/IP Connections

☐ All

☐ Authorized Only

☒ None

☐ VT1000 IP Address (manual): _____

IP Subnet Mask: _____

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From the Customize TCP/IP dialog box, you can change any of the following settings:

TCP/IP Connections

You can choose which hosts can connect to your VT1000 terminal. Normally, only authorized hosts can make connections to the terminal. To select all hosts or none, click on the appropriate button.

Default: Authorized Only

Determine IP Address

Clicking on this button makes the VT1000 redetermine its IP address, using the TCP/IP BOOTP protocol. BOOTP is an Internet protocol that determines an IP address.

After you click on the Determine IP Address button, a few messages will appear in the Messages region of the VT1000 Terminal Manager window, along with the IP address of the terminal. The next time you enter the Customize TCP/IP dialog box, the terminal's IP address appears in the VT1000 IP Address (manual): text entry field.

NOTE

The system manager of a host system running the BOOTP daemon must configure your terminal's hardware and IP address into the BOOTP daemon's configuration file.

VT1000 IP Address (manual):

You can manually enter an IP address for your VT1000 terminal. To do this, click on the VT1000 IP Address (manual): button then enter an address. The address can have up to 30 characters. After you enter an IP address, the terminal uses that address by default.

Your system manager can provide the correct IP address for your terminal.

IP Subnet Mask:

You can manually enter an IP subnet mask for your VT1000 terminal. An IP subnet mask acts as a filter for your TCP/IP network. Using the subnet mask makes the terminal ignore certain traffic on the network.

To specify an IP subnet mask, click on the IP Subnet Mask: space then type in a subnet mask. The IP subnet mask has the same format as the IP address. After you enter a subnet mask, the terminal uses that mask by default.

Your system manager can provide the correct subnet mask for your terminal.

Changing Your Font Path Settings

A font is a set of characters in a particular type style. A video terminal displays characters from a selected font. The VT1000 terminal has its own set of character fonts, but you may need to use alternate fonts from font files available on your host system. Some X window and DECwindows applications require alternate character fonts to work correctly.

To find font file information on the host, the terminal needs a font path. You can specify a font path by choosing the Font Path... menu item from the VT1000 Terminal Manager's Customize menu. The Customize Font Path dialog box looks like this:

Customize Font Path

Font Path Selection

☒ LAT Font Path

☐ TFTP Font Path

LAT Font Path ROM,

TFTP Font Path ROM,

OK Apply Cancel

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From the Customize Font Path dialog box, you can change any of the following settings:

Font Path Selection

The Font Path Selection determines which font path is active. If your terminal communicates over the LAT protocol, choose the LAT Font Path. If your terminal communicates over the TCP/IP or TELNET protocol, select TFTP.

LAT Font Path

To enter a LAT font path, click on the text entry field and enter the path name. The path name can have up to 30 characters.

The terminal can use its own fonts by default, or another font set provided on a node in your system. A value of ROM, indicates the terminal is using its own default fonts.

To specify font paths for your system, use the syntax *node::logical_name* for each entry. Make sure you include a comma between ROM and the alternate font path. The following examples show the format of various entries:


```
ROM,  
ROM,beta::sys$fonts:
```

TFTP Font Path

To enter a TFTP font path, click on the text entry field and enter the path name. The path name can have up to 30 characters.

The terminal can use its own fonts by default, or another font set provided on a node in your system. A value of ROM, in the space indicates that the VT1000 is using its own default fonts.

To specify font paths for your system, use the syntax *IP_address::path_name* for each entry. Make sure you include the comma between ROM and the alternate font path.

The following examples show the format of various entries:

```
ROM,  
ROM,123.45.67.89:/tftpboot/VT1000/font.paths
```

6

Using Video Terminal Windows

For some jobs, you may want to log in to a host system as you would on a conventional video terminal. The VT1000 terminal lets you open a video terminal (VTE) window. The VTE window offers the features of Digital's VT320 terminal with some enhancements. This chapter describes the video terminal (VTE) window and how to use it.

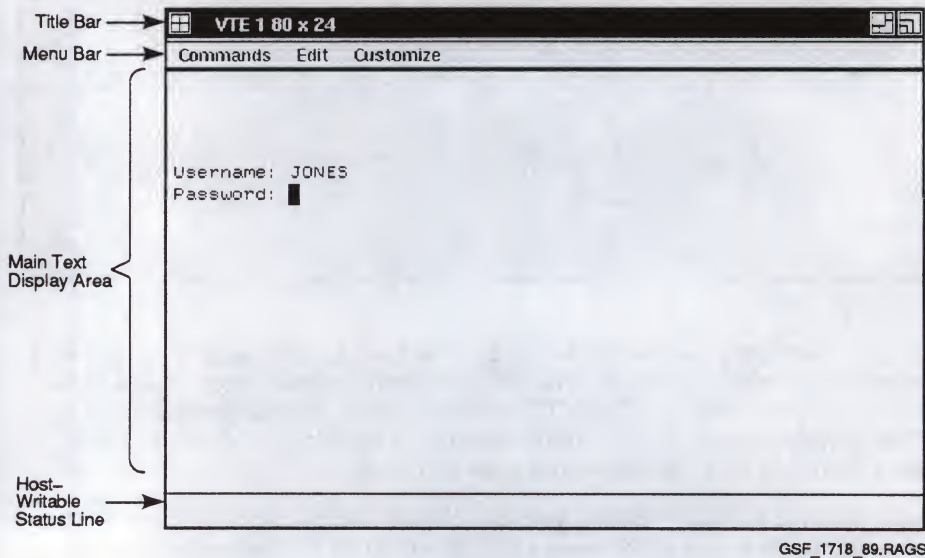
When you use a VTE window, you use the keyboard to interact with the host system. You can have several VTE windows on the screen at the same time, running different applications in each window. You can use your mouse to move between windows.

This chapter describes how to:

- Clear or reset the VTE window.
- Copy and paste information.
- Customize the VTE window settings

VTE Window Format

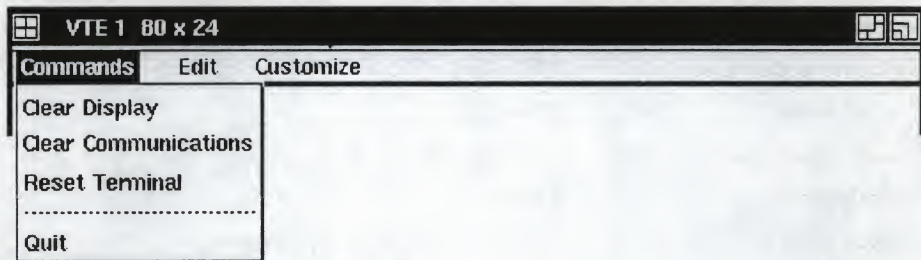
Chapters 3 and 5 describe how to start a video terminal session. The VTE window looks like this:



- The **title bar** identifies this window as a VTE window. VTE windows are numbered in the order that you open them. The title also includes the number of rows and columns available in the window. You can change this setting. windows are numbered
- The **menu bar** displays the names of the three pull-down menus available from the VTE window:
 - Commands
 - Edit
 - Customize
- The **main text display area** is your working area, similar to a video terminal screen. You interact with host applications in this area. By default, the size of this area is 24 lines by 80 columns. You can change the size by using the Customize menu in this window.
- If enabled, the **host-writable status line** lets host applications display messages to the user. A solid line separates the status line from the main text display area. By default, the status line is disabled.

Clearing, Resetting, or Leaving the Session

The Commands menu lets you clear, reset, or quit the VTE window. You pull down the Commands menu from the VTE window's menu bar. The Commands menu looks like this:



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From the Commands menu, you can perform the following functions:

Clear Display

Choosing this item clears the contents of the current VTE window.

Clear Communications

Choosing this item performs the following actions:

- Cancels any print operation in progress.
- Cancels any escape sequence, control sequence, control string, or character string processing in progress.
- Clears the keyboard buffer.
- Clears the receive buffer.

Reset Terminal

Choosing this item sets several terminal operating features to their default settings.

Resets ...	To ...
Cursor mode	Visible.
Insert/replace mode	Replace.
Origin mode	Upper left of window, independent of margins.
Autowrap mode	Off.
Keyboard action mode	Unlocked.
Keypad mode	Numeric.
Cursor key mode	Normal.
Top margin	Line 1.
Bottom margin	The bottom line in the window.

Quit

Choosing this item removes the VTE window and ends the connection to the host (LAT or TCP/IP TELNET).

Copying and Pasting Text

You can copy and paste text in a window. You can also copy text from one window to another. To copy and paste text, you use the Edit menu. You pull down the Edit menu from the VTE window's menu bar. The Edit menu looks like this:



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From the Edit menu, you can perform the following functions:

Copy

Choosing this item places the currently selected text into the terminal's copy buffer. You can also use the Select All menu item to select the complete window.

Paste

Choosing this item sends the contents of the terminal's copy buffer to the host application.

Select All

Choosing this item places all of the window's text into the terminal's copy buffer. You can also use the Copy menu item to place selected text into the copy buffer.

NOTE

To use the copy and paste features on a VMS system, make sure you enter the following DCL command:

```
$ SET TERMINAL/HOSTSYNC
```

Selecting Text to Copy

You can select text a word, a line, or a block at a time. A block can be a single character or any number of contiguous characters, up to the complete window. You can also use the Select All menu item in the Edit menu to select the complete window.

To select a block of text:

1. Point to the start of the block.
2. Press and hold MB1, then drag the pointer to the end of the block.
3. Release MB1 to indicate the end of the block.
4. In the Edit menu, choose the Copy menu item.

To select a single word:

1. Point to the word.
2. Double click MB1 to select the word.
3. In the Edit menu, click on the Copy menu item.

To select a line of text:

1. Point to the line.
2. Triple click MB1 to select the line.
3. In the Edit menu, click on the Copy menu item.

To extend the current selection of text without starting a new select operation:

1. Point to the end of the text you have already selected.
2. Hold down the **[Shift]** key and MB1, then drag the pointer to the end of the additional text you want selected.
3. Release **[Shift]** and MB1 to indicate the end of the text.
4. In the Edit menu, click on the Copy menu item to place the selected text in the copy buffer.

Pasting Text

After you have selected text and stored it in the copy buffer, you can send it to a host system. You can paste the text into the same VTE window, or into a different VTE window.

To paste text:

1. Place the cursor where you want to copy the text, by pointing and clicking MB1.
2. Choose the Paste menu item in the Edit menu. The terminal copies the text to the new location.

Using QuickCopy

After you select text as described in "Selecting Text to Copy", you can immediately paste the text without storing it in the copy buffer.

To use QuickCopy:

1. Place the cursor where you want to copy the text.
2. Click MB3 to paste the text. Each time you click MB3, the terminal pastes the text to the current point.

You can use QuickCopy to copy text from one VTE window to another by moving the input focus to another window, then clicking MB3.

Customizing the VTE Window

You can set many features of the VTE window to your personal preference by using the Customize menu in the VTE window's menu bar. This menu is similar to the Customize menu in the VT1000 Terminal Manager window (Chapter 5). The VTE window offers functions similar to Digital's VT320 terminal, with some enhancements.

From the VTE's Customize menu, you can change

- Window settings, such as the number of rows and columns displayed
- Display settings, such as the cursor style and background color
- General operating settings, such as the terminal's operating mode and character set selection
- Keyboard settings, such as the warning bell and the auto repeat function for keys
- National replacement character sets (NRCs), if you use 7-bit character sets

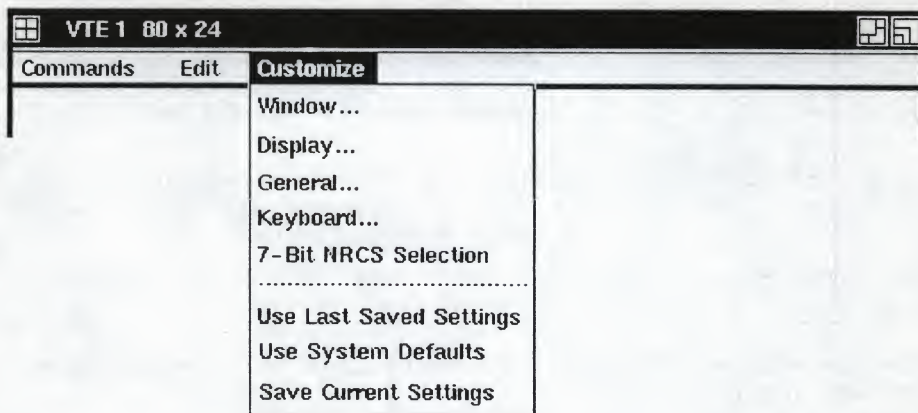
Some applications that you use may also set certain window features. Programmers can use control sequences in applications to customize most VTE features from the host system. See Chapter 10. This type of customization provides more control to individual applications.

When You Open a Window . . .

The VT1000 terminal holds one complete set of feature settings in nonvolatile memory. The terminal uses these settings to initialize newly created VTE windows.

Displaying the Customize Menu

Pull down the Customize menu from the VTE window's menu bar. The Customize menu looks like this:



Choosing any menu item displays a dialog box for that item. The following sections describe each dialog box.

Each dialog box has three push buttons for recording or dismissing new settings:

Click on ...	To ...
OK	Record new settings and dismiss the dialog box.
Apply	Record new settings without dismissing the dialog box.
Cancel	Dismiss the dialog box without changing any settings. If you made any changes without applying them, clicking on the Cancel button cancels those changes.

Saving and Recalling Settings

If you make changes to settings, you can save them for use in all future VTE windows. If you do not your new settings, they are lost when you end your current session.

If you make temporary changes to settings, you can recall the factory-default settings or the last settings you saved.

To save or recall settings, use the following menu items from the Customize menu:

Choose ...	To ...
Use Last Saved Settings	Recall the last settings you saved. Choose this menu item if you want to reset any features that you changed temporarily, but did not save.
Use System Defaults	Recall the VT1000 factory-default settings from read-only memory and from the host system defaults, if available.
Save Current Settings	Save the settings you just changed, so you can use them in all future sessions.

Some new settings do not take effect until you end your current session and begin another one.

Changing Your VTE Window Settings

To change your VTE window settings, select the Window... menu item in the VTE Customize menu. The Customize VTE Window dialog box looks like this:

Customize VTE Window

☒ **Auto Resize Terminal**

Terminal Size

Rows	Columns
<input type="text"/>	<input type="text"/>
24	80
36	132

☒ Big Font
☐ Little Font
☐ Normal Font (80 Columns)
☐ Condensed Font (132 Columns)
☒ Normal/80, Condensed/132

Window Title

Icon Title

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You can change the following features in the Customize VTE Window dialog box:

Auto Resize Terminal

If the size of a terminal window changes, the terminal normally adjusts the number of display rows and columns to match the window's size. You can turn this feature off or on by clicking on the Auto Resize Terminal button.

Terminal Size

You can choose the number of rows and columns each VTE window uses. Normally, VTE windows use 24 rows by 80 columns to display data. There are two ways to change the number of rows and columns:

- Click on the Rows and Columns text entry fields under Terminal Size, then enter the desired settings. You can use from 1 to 36 rows and from 1 to 132 columns.
- Click on the desired number: 24 or 36 rows, 80 or 132 columns.

Default: 24 rows × 80 columns

Big Font, Little Font

Normally, the terminal uses the Big Font setting with monitors that have 100 dot/inch screens, and the Little Font setting with monitors that have 75 dot/inch screens.

To choose the Big or Little Font, click on the appropriate button.

Normal Font, Condensed Font

Normally, the terminal displays characters in a font suitable for the display width—80 or 132 columns. You can also choose to use the normal font or condensed font at all times, by clicking on the Normal Font (80 Columns) button or Condensed Font (132 Characters) button. The condensed font lets you display more characters in a small window.

Default: Normal/80, Condensed/132

Window Title

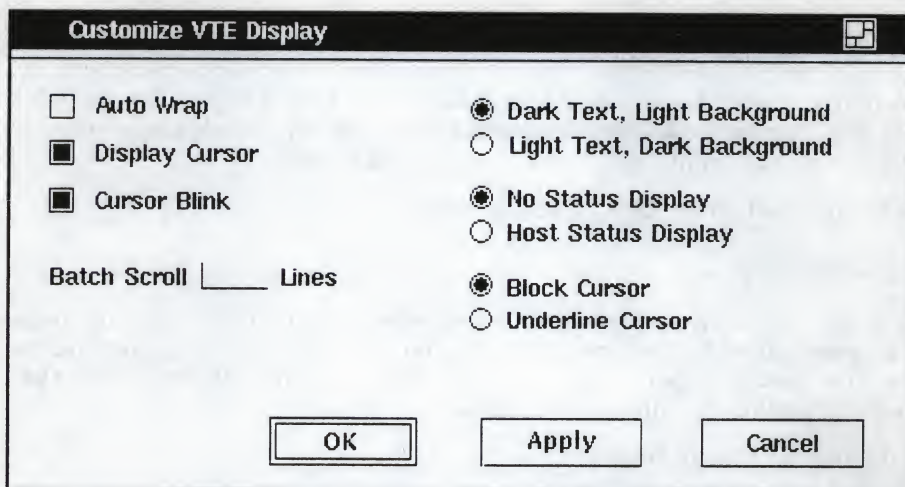
You can choose a unique title for each VTE window you open. To enter a title, click on the Window Title text entry field. The title can have up to 30 characters.

Icon Title

You can choose a unique icon title for each VTE window you use. To enter a title, click on the Icon Title text entry field. The title can have up to 30 characters.

Changing Your VTE Display Settings

To change your VTE display settings, select the Display... menu item in the VTE Customize menu. The Customize VTE Display dialog box looks like this:



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You can change the following settings in the Customize VTE Display dialog box:

Auto Wrap

Normally, text does not automatically wrap to the next line when the cursor reaches the right margin in the window. Click on the Auto Wrap toggle button to select whether or not text automatically wraps to the next line.

Default: off

Display Cursor

Normally, the text cursor appears in the VTE window as a block or underline character. Click on the Display Cursor toggle button to select whether or not to display a text cursor.

Default: on

Cursor Blink

Normally, the text cursor blinks. Click on the Cursor Blink toggle button to select whether the text cursor blinks or remains steady in the VTE window.

Default: Cursor Blink

Text and Window Background

Normally, the VTE window displays dark text with a light background. You can change the window to display light text on a dark background by clicking on the Light Text, Dark Background button.

Default: Dark Text, Light Background

Status Display

Normally, the VTE window does not display a status line. You can choose to display a host status line by clicking on the Host Status Display button. The host status display is a line at the bottom of the window where the host application can display messages.

Default: No Status Display

Cursor style

Normally, the terminal uses a solid block cursor to indicate the active position. You can choose an underline character for the cursor by clicking on the Underline Cursor button.

Default: Block Cursor

Changing General Operating Features

To change general operating settings, select the General . . . menu item from the VTE Customize menu. The Customize General dialog box appears:

Customize General

☐ Newline
☐ Lock UDKs
☐ Lock User Features
☒ Normal Cursor Keys
☐ Appl Cursor Keys
☒ 8-Bit Multinational Characters
☐ 7-Bit NRCS Characters

☒ Numeric Keypad
☐ Application Keypad
☒ UPSS DEC Supplemental
☐ UPSS ISO Latin 1
☒ VT300 8-Bit Controls
☐ VT300 7-Bit Controls
☐ VT100
☐ VT52

Terminal ID

☒ VT1000 ID
☐ DECTerm ID
☐ VT320 ID
☐ VT220 ID
☐ VT102 ID
☐ VT101 ID
☐ VT100 ID

Answerback Message

☐ Conceal Answerback Message

OK Apply Cancel

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From the Customize General dialog box, you can change any of the following settings:

Newline

This toggle button determines whether or not the **Return** key moves the cursor to a new line. Normally, pressing the **Return** key sends a carriage return character, but does not move the cursor to a new line. When you click on the Newline toggle button, pressing **Return** sends a carriage return and a line feed. Some non-Digital applications use the Newline feature.

Default: off

Lock UDKs

You can choose whether or not the host system can change user-defined key (UDK) definitions. Normally, the host can change UDK definitions. When you click on the Lock UDKs toggle button, the host cannot change UDK definitions.

Default: off

Lock User Features

You can choose whether or not the host system can change the settings of certain customized features that users often set to their own preference, including Column Mode, Display Background, and Auto Repeat. Normally, the host can change these user features. When you click on the Lock User Features toggle button, the host cannot change these features.

Default: on

Cursor Keys

Normally, the arrow keys send standard ANSI cursor control sequences. Clicking on Appl Cursor Keys lets the arrow keys send application-specific control sequences.

Default: Normal Cursor Keys

8-Bit Multinational or 7-Bit NRCS Characters

You can select the type of characters the terminal uses, 8-bit multinational or 7-bit national replacement characters.

Normally, the terminal uses 8-bit multinational characters. This setting supports most of today's computing environments. There are two multinational character sets—the DEC Multinational character set and the ISO Latin-1 character set. Both character sets consist of the standard 7-bit ASCII character set and their own supplemental set. To choose one of the multinational character sets, you choose their supplemental set—DEC Supplemental or ISO Latin-1—with the UPSS buttons in this dialog box.

Clicking on the 7-Bit NRCS Characters button lets the terminal use one of several national replacement character sets. This setting is useful in computing environments that are restricted to 7 bits. NRC sets are 7-bit character sets for the major Western European languages. When you choose this setting, the terminal uses the NRC set that matches the current Keyboard Type chosen in the VT1000 Terminal Manager's

Customize Keyboard dialog box (Chapter 5), by default. You can also choose the individual NRC set by using the 7-Bit NRCS Selection menu item from the VTE Customize menu.

Terminal ID

The VT1000 terminal sends the host system a terminal identification (ID) message to let the host know specific operating characteristics of the terminal. Normally, the terminal sends an ID of VT1000. You can choose which terminal ID the VT1000 sends to the host. The terminal ID is also called the device attributes response.

Default: VT1000 ID

Numeric Keypad

Normally, the keys on the numeric keypad send the number or punctuation mark shown on the keys (using ASCII codes). Clicking on the Application Keypad button lets the numeric keypad keys send control sequences used with some applications.

Default: Numeric Keypad

User-Preferred Supplemental Set (UPSS)

If you choose the 8-Bit Multinational Characters button in this dialog box, you can choose one of two supplemental character set to use—DEC Supplemental or ISO Latin 1 Supplemental. Both character sets feature special characters used in the major European languages. The ISO Latin-1 set includes a few more characters that are not included in the DEC supplemental set.

Normally, the terminal uses the DEC Supplemental character set. Clicking on UPSS ISO Latin 1 lets the terminal use the ISO Latin-1 Supplemental set.

Default: UPSS DEC Supplemental

Terminal Mode

You can choose the terminal's operating mode. The VT1000 terminal can emulate any VT series text terminal.

Normally the terminal uses VT300 8-Bit Controls. This mode lets the terminal use all VT1000 features. The terminal uses 8-bit graphic characters and 8-bit control characters. This mode supports VT300, VT200, and VT100 applications. Digital recommends this mode for most applications.

Clicking on VT300 7-Bit Controls lets the terminal use 8-bit graphic characters with 7-bit control characters. Use this mode with VT300 and VT200 applications that use 7-bit control characters.

Clicking on VT100 lets the terminal run applications that require VT100 compatibility.

Clicking on VT52 lets the terminal run VT52 applications.

Default: VT300 8-Bit Controls

Answerback Message

Normally, the terminal sends an answerback message to the host system after making a connection. To enter an answerback message, click on the Answerback Message text entry field. Your message can have up to 30 characters.

The terminal sends this message to the host system when (1) you type , or (2) the host requests the message by sending an ENQ character. Host requests do not affect screen data or require a user response.

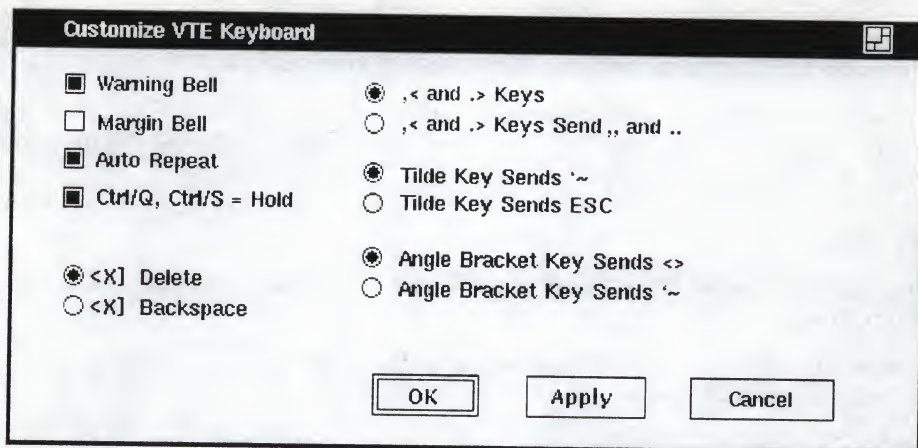
Conceal Answerback Message

You can conceal your answerback message by clicking on the Conceal Answerback Message button. When you conceal the message, you cannot see the message in the Customize General dialog box.

Default: off

Changing VTE Keyboard Features

To change keyboard settings used with VTE windows, choose the Keyboard . . . menu item from the VTE Customize menu. The Customize VTE Keyboard dialog box appears:



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From the Customize VTE keyboard dialog box, you can change any of the following settings:

Warning Bell

Normally, a warning bell sounds whenever the terminal receives a bell (BEL) character from the host application. You can turn this feature off or on by clicking on the Warning Bell toggle button.

Default: on

Margin Bell

The terminal can sound a bell when the cursor approaches the right margin. Normally, the margin bell feature is turned off. You can turn this feature on or off by clicking on the Margin Bell toggle button.

Default: off

Auto Repeat

Normally, most keys on the keyboard automatically repeat when you hold them down. You can turn this feature off or on by clicking on the Auto Repeat toggle button.

Default: on

Ctrl/Q, Ctrl/S = Hold

Normally, pressing **Ctrl S** prevents data from scrolling in a VTE window. Pressing **Ctrl Q** allows scrolling to resume in the window.

You can turn this feature off or on by clicking on the Ctrl/Q, Ctrl/S = Hold toggle button. If you turn the feature off, pressing **Ctrl S** or **Ctrl Q** have no effect on scrolling.

<X> key

Normally, pressing the **<X>** key sends a delete (DEL) character to the host application.

When you click on the **<X>** Backspace button, the **<X>** key sends a backspace (BS) character.

Default: **<X>** Delete

,< and .> Keys Send ,, and ..

You can choose to have **<** key always send a comma and the **>** key always send a period, whether the keys are shifted or unshifted. Normally, this feature is off, and the **<** and **>** keys send their respective characters. You can turn this feature on or off by clicking on the ,< and .> Keys Send ,, and .. toggle button.

Default: off

Tilde Key

You can choose to send an escape (ESC) character when you press the tilde **`** or **Shift `** keys. Normally, pressing **`** key sends a ' character to the host, and pressing **Shift `** sends a ~ character. You can turn the ESC feature on or off by clicking on the '~ Key Sends ESC toggle button.

Default: off

Angle Bracket Key

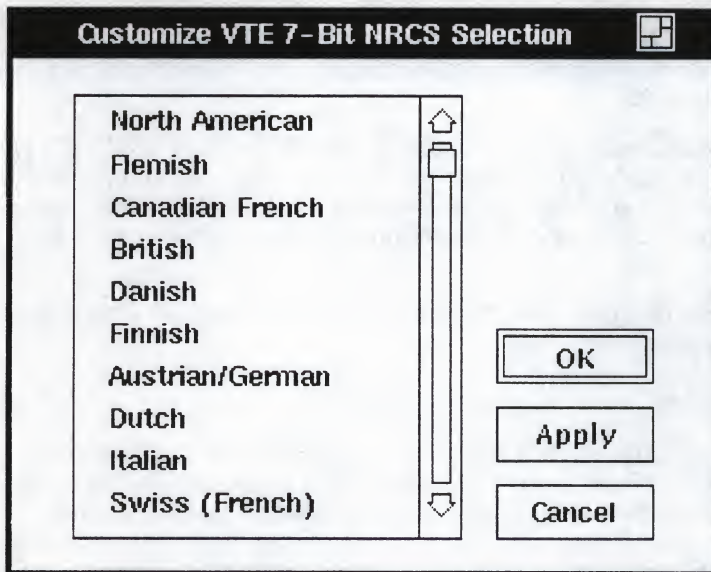
You can choose to send a ' character when you press the **<** key and a ~ character when you press the (Shift) **>** keys. Normally, pressing **<** sends a < character to the host. Pressing **Shift >** sends a > character. You can turn this feature on or off by clicking on the <> Key Sends '~ toggle button.

Default: off

Selecting National Replacement Character Sets

You can use 8-bit multinational character sets or 7-bit national replacement character (NRC) sets with VTE windows. You should use the type of character set that matches your computing environment. To choose the type of character set, use the General... menu item from the VTE Customize menu.

When you choose to use 7-bit character sets, the terminal uses the NRC set that matches the current Keyboard Type chosen in the VT1000 Terminal Manager's Customize Keyboard dialog box (Chapter 5), by default. You can also choose an NRC set from the 7-Bit NRCS Selection menu item from the VTE Customize menu. The Customize 7-Bit NRCS Selection dialog box looks like this:



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The scroll box lists all the NRC sets available. To choose an NRC set for the current VTE window, click on a set in the scroll box and then click on the OK button.

NOTE

The NRC set you select should match the Keyboard Type chosen in the Customize Keyboard dialog box.

7

The Keyboard

This chapter describes the basic function of each keyboard key and indicator. Chapter 8 describes how to type additional characters not shown on the keys.

LK401 Keyboard

The VT1000 terminal uses Digital's LK401 keyboard. The LK401 keyboard comes in many versions for use with different languages and dialects. The only physical difference between these keyboards are the legends on the keys. Appendix F shows the different versions of the LK401 keyboard.

The figures in this chapter show the North American/United Kingdom keyboard, unless otherwise noted.

Keyboard Dialect

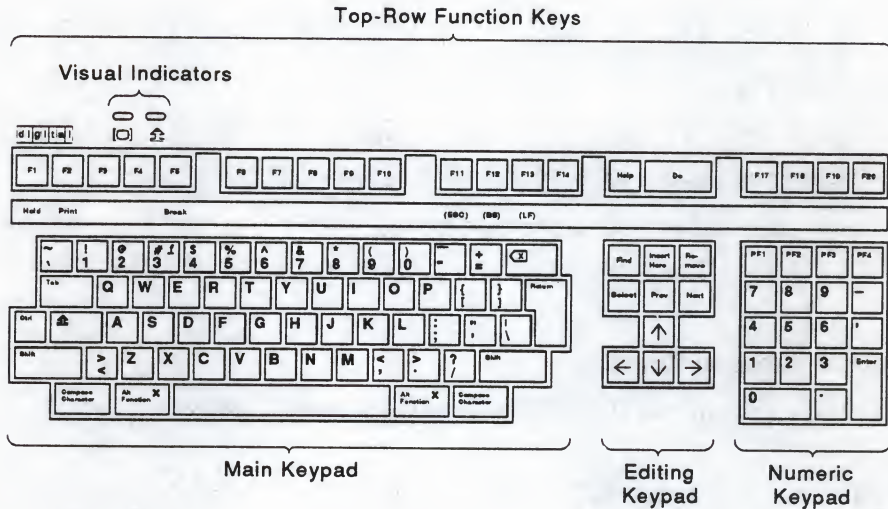
The VT1000 is initially set to work with the North American/United Kingdom keyboard. If you have a keyboard for a different language or you want to use the British dialect, you must change the **Keyboard Type** setting in the Customize Keyboard dialog box. See "Changing Your Keyboard Settings" in Chapter 5.

Layout

The LK401 keyboard has four groups of keys and two visual indicators. The keys are grouped by function.

- Main keypad
- Editing keypad
- Numeric keypad
- Top-row function keys

The LK401 keyboard also has two audible indicators, a keyclick and bell.

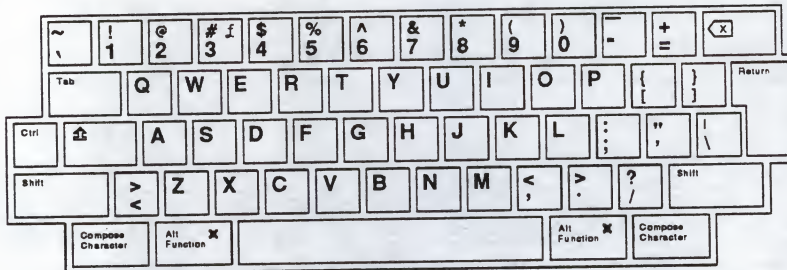


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Main Keypad

The main keypad is similar to a typewriter keyboard with alphanumeric characters, punctuation marks, and **Shift** keys. The main keypad also has a number of keys not found on a standard typewriter, such as the **Ctrl** modifier key and the **Compose Character** prefix keys. The German keyboard has a **Group Shift** key and **Alternate Shift** key instead of **Compose Character** keys.

Modifier keys are pressed in combination with another key, to modify the code sent by that key. *Prefix keys* are pressed and released before pressing another key, to change the function of one or more keystrokes.



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Special-Function Keys

The main keypad has the following special-function keys:

- Tab** Pressing **Tab** sends a horizontal tab, which normally moves the cursor to the next tab stop. Applications can change tab stops.
- Ctrl** Holding down **Ctrl** and pressing another key sends a control code to the host.
- For example, **Ctrl Z** means to hold down **Ctrl** and press the **Z** key.
- Shift** There are left and right **Shift** keys. Holding down **Shift** and pressing a standard key sends the shifted (top) character on the key.
- Holding down **Shift** and pressing a special-function key starts a predefined control function. For example, **Shift F2** (Print) means to hold down **Shift** while pressing the **F2** (Print) key.



Pressing the lock key down puts the keyboard in caps lock mode or shift lock mode. You can set the mode from the Customize Keyboard dialog box (Chapter 5). The default setting is Caps Lock.

- In caps lock mode, the alphabetic keys send their uppercase or shifted character when pressed alone. You can use a **Shift** key to send the shifted character on other keys. You turn caps lock mode on and off by pressing and releasing the lock key.
- In shift lock mode, all keys on the main keypad send their shifted character. You can turn shift lock mode on by pressing the **Lock** key. You can turn it off by pressing either the lock key or **Shift** key.

When the lock key is down, the lock indicator on the keyboard turns on.

Return

Pressing **Return** sends either a carriage return or a carriage return and a line feed (newline). You can select the function of the **Return** key from the Customize General dialog box (Chapter 6).

<X
Backarrow
key

Pressing the **<X** key normally sends a delete (DEL) character. Many applications use DEL to erase one character to the left of the cursor.

You can make the **<X** key send a backspace (BS) character instead of DEL. You can select the function of the **<X** key from the Customize VTE Keyboard dialog box (Chapter 6).

Space bar

Pressing the space bar sends a space (SP) character. You use spaces to separate words or move the cursor forward.

**Compose
Character
(left and
right)**

These are prefix keys, used to generate characters that do not appear as standard keys on your keyboard. See Chapter 8.

On the German keyboard, the **Compose Character** key is replaced by **Group Shift** and **Alternate Shift**.

Group
Shift

Alternate
Shift
(German)

Alt
Function
(left and
right)

You use **Group Shift** as a prefix or modifier key, to type the characters on the right half of keycaps. See Chapter 8.

Alternate Shift is a modifier key, used to generate a no break space (NBSP) or soft hyphen (SHY) character.

Alternate Shift + space bar = NBSP character.

Alternate Shift + **-** = SHY character.

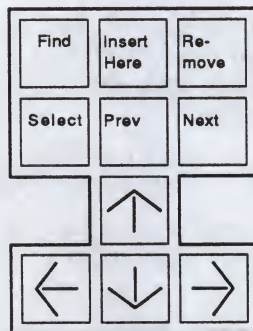
You use **Alt Function** with other keys, to select alternate functions defined by your application software.

Editing Keypad

The editing keypad has four arrow keys and six editing keys.

Pressing an arrow key normally moves the text cursor in the direction of the arrow. For example, pressing the **↓** key moves the cursor down one line. The arrow keys do not move the mouse pointer.

The six editing keys generally perform screen control functions defined by application software.

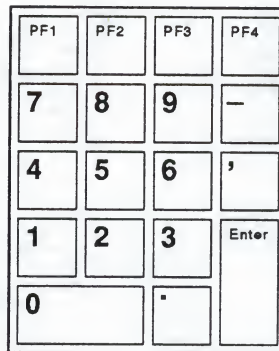


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Numeric Keypad

Numeric keypad keys often have functions assigned by your software applications, especially **PF1** to **PF4**. For example, you may use a spreadsheet program that assigns special functions to these keys. See your application manuals for details.

You can use the numeric keypad to enter numeric data as you would with a calculator. Programmers can use this keypad to do hexadecimal compose sequences. See “Hexadecimal Key Sequences” at the end of Chapter 8.



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Enter

The **Enter** key on the numeric keypad normally works like the **Return** key. **Enter** sends a carriage return, or a carriage return and a line feed. You can select the function of the **Return** key from the Customize General dialog box (Chapter 6).

Application software may use **Enter** as a special-function key.

, (Comma)
. (Period)

If you select the German, Spanish, or Portuguese keyboard type from the Customize Keyboard dialog box (Chapter 5), the **.** (period) and **,** (comma) keys on the numeric keypad are reversed to match the European convention for numeric entry. **.** sends a comma, and the **,** sends a period.

When you use video terminal (VTE) windows, you can set the function of the keypad as a numeric keypad or application keypad. See the Customize General dialog box in Chapter 6.

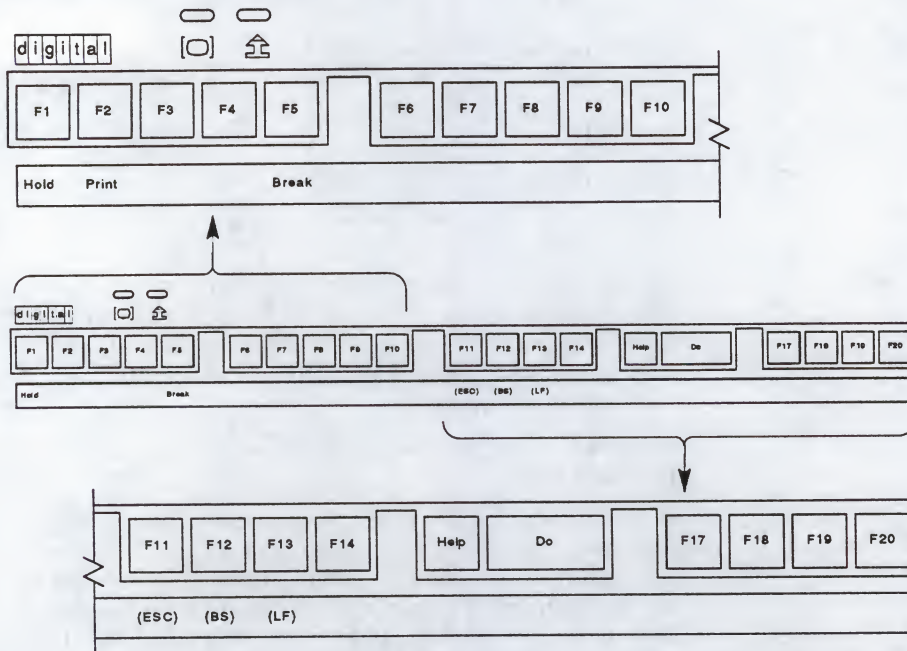
NOTE

The German keyboard dialect does not affect the application keypad mode.

Top-Row Function Keys

Predefined Keys

The first five top-row keys, **F1** to **F5**, are predefined to perform the following functions. You cannot change these functions. Your application software defines the functions of the remaining top-row keys. See your application manual for details.



F1 (Hold) Pressing **F1 (Hold)** puts the screen display in the active window on hold. This stops the scrolling of text, which can make reading easier. When you press **F1 (Hold)**, the hold indicator on the keyboard turns on. Pressing **F1 (Hold)** again allows scrolling to resume.

F2 (Print) Pressing **F2 (Print)** sends the text in the active window to the printer.

The output may or may not correspond exactly to the display in the window. The output depends on the window size and font size. See Chapter 9 for information on printing.

Ctrl F2 Pressing **Ctrl F2 (Print)** turns auto print mode on or off. In auto print mode, you can automatically print each line of text as it is received from the host system. See Chapter 9.

F3 This key is disabled.

F4 This key is disabled.

F5 (Break) Pressing **Break** ends communication with your system if you are using a VTE window running over the serial communication line.

Pressing **F5 (Break)** has no effect on LAT or TCP/IP connections.

Shift F5 Pressing **Shift F5 (Break)** performs a disconnect on the serial communications port associated with the current session. A disconnect is normally used to end communication with a modem in preparation for another call.

Ctrl F5 Pressing **Ctrl F5 (Break)** sends the answerback message to the system, regardless of the communications channel used.

NOTE

Ctrl F5 (Break) sends the answerback message even if you set the **Conceal Answerback Message** in the **Customize General** dialog box (Chapter 6).

User-Defined Keys and Application-Specific Keys

The function of the remaining top-row keys, **F6** to **F20**, often depends on your application software. Refer to your application software manuals for a description of key functions. You can also define the function of these keys yourself.

F6 to **F20**

When pressed alone, these keys send predefined programming sequences to the host system (Chapter 10). Applications that recognize these sequences can use the keys to perform various functions.

In VT100 and VT52 modes

Keys **F11**, **F12**, and **F13** send control characters **ESC**, **BS**, and **LF** respectively. Keys **F6** to **F10** and **F14** to **F20** do not function.

Shift **F6**

to

Shift **20**

User-defined keys (UDKs)

Pressing **Shift** and one of these keys sends the user-defined function for that key. You can define keys **F6** to **F20** by using programming sequences. You can use any sequence of characters in your definitions. Definitions are loaded from the host system. See the Chapter 10 for details.

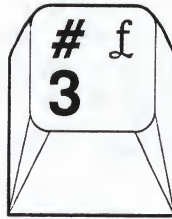
Data Processing Keys

Most versions of the LK401 keyboard have some keys with characters on the left half and right half of their keycap. Normally, you use the characters on the left half of the key. These are called typewriter characters. The characters on the right half are for data processing use.

You can set these keys to send their typewriter or data processing characters, by selecting the keyboard type. See "Changing Your Keyboard Settings" in Chapter 5. One exception is the North American/United Kingdom keyboard.

£ Key

The North American/United Kingdom standard keyboard has only one key with three characters.



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To use the £ symbol, you choose the British Keyboard type. To use the # symbol, you choose the North American Keyboard type. There are no separate data processing legends on the North American/United Kingdom keyboard.

The right legend on this key is used when the British Keyboard type is selected, and the left legend is used when the North American Keyboard type is selected. There are no separate data processing legends on the North American/United Kingdom keyboard.

Compose Characters

You can type compose sequences to display many more characters than those shown on the keycaps. For example, you can display accented letters. Chapter 8 describes how to use compose sequences.

Indicator Lights

The keyboard has two indicator lights that work with the **F1** (Hold) and lock keys. The indicator lights are at the upper-left of the keyboard.



Turns on or off when you press the **F1** (Hold) key.



Turns on or off when you press the lock key.

Audible Indicators

The keyboard has two audible indicators, a keyclick and a bell. You can use the bell as a margin bell, warning bell, or both. You can turn off the keyclick and bell, or adjust their volume. See the Customize Keyboard dialog box (Chapter 5).

Keyclick

You hear the keyclick sound each time you press a key that sends a code or causes the terminal to take some immediate action. If a key is autorepeating, the keyclick will repeat once for each character or key sequence sent. Keys do not click under the following conditions:

- You press **[Shift]** or **[Ctrl]**. These keys never click except when **[Shift]** is leaving the shift-lock state.
- You turn off the keyclick in the Customize Keyboard dialog box.
- You press a key or key combination that does not have a function under the current operating conditions. Examples: **[F6]** to **[F10]** in VT100 mode; invalid control combinations; and keys that generate 8-bit codes, when you use 7-bit national replacements character sets.

Bell

The bell tone is a beeping sound. You can use the bell as a margin bell, warning bell, or both.

Margin Bell

This bell sounds when the cursor is eight characters from the right margin.

Warning Bell

This bell sounds for any of the following conditions:

- During the power-up self-test
- When the terminal receives a bell (BEL) character from the host system
- After a compose character error

Typing Additional Characters

The VT1000 terminal lets you type more characters than appear on your keyboard. For example, you can type accented characters or a © symbol. This chapter lists the available characters and shows you how to select them.

To enter one of these characters, you type a sequence of keys. Most sequences begin with one of the `Compose Character` keys. If you use the German keyboard, you use the `Group Shift` key instead of `Compose Character`.

This chapter describes the following types of key sequences:

- Three-stroke `Compose Character` sequences (with all LK401 keyboards)
- `Group Shift` sequences (with the German keyboard)
- Two-stroke key sequences (with keyboards that have nonspacing diacritical keys)
- Hexadecimal key sequences (for programmers)

Two basic factors determine the key sequences you can use.

- The Keyboard Type setting, which should match your keyboard type (Chapter 5).
- The character set the terminal is currently using (Chapter 6).

What Characters Can I Type?

You can type any of the characters in the character set the terminal is currently using. You can select from two multinational sets (DEC Multinational or ISO Latin Alphabet No. 1) or many national replacement character sets (NRCs). The Customize VTE General dialog box lets you set the terminal to work with 8-bit multinational sets or 7-bit NRC sets. If you choose 7-bit NRC sets, the Customize VTE 7-Bit NRCS Selection dialog box (Chapter 6) lets you choose a specific NRC set.

By default, the VT1000 uses the DEC Multinational character set. Chapter 1 describes multinational and national character sets, and Chapter 10 shows each character set.

Key Sequences with Nonspacing Diacritical Keys

Table 8-1 lists the keyboards that have keys with *diacritical marks*. Table 8-2 lists all the additional characters for all character sets in the VT1000 terminal. Many of these characters include a diacritical mark. For example, Á includes an acute accent.

To enter a character that has a diacritical mark, you press the diacritical key followed by the character. If your keyboard does not have the diacritical key, you must press the Compose Character key followed by the correct key sequence listed in Table 8-2.

To use diacritical keys, you must be using a multinational character set.

Table 8-1 Keyboards with Diacritical Marks

Keyboard	Grave Accent	Acute Accent	Circumflex Accent	Tilde Mark	Umlaut
Finnish	yes	no	yes	yes	no
Flemish	yes	no	yes	yes	yes
French/Belgian	yes	no	yes	yes	yes
French Canadian	yes	no	yes	yes	no
German	yes	yes	yes	yes	yes
Portuguese	no	no	no	yes	no
Spanish	yes	yes	yes	yes	yes
Swedish	yes	no	yes	yes	no
Swiss (French)	yes	no	yes	yes	yes
Swiss (German)	yes	no	yes	yes	yes

How to Type a Character Using the Compose Character Key

To enter a Compose Character key sequence:

1. Find the character you want to type in Table 8-2.
2. Press the Compose Character key.
3. Type the sequence in Table 8-2 for the character you want.

Example

To type an é:

1. Find the é character in Table 8-2.
2. Press Compose Character.
3. Type e and ' (apostrophe).

NOTE

If you try to enter a character that is not available in the current character set, a warning bell sounds. See “Invalid Sequences” in this chapter.

How to Type a Character Using the Group Shift Key

If you select the Austrian German keyboard type in the Customize Keyboard dialog box (Chapter 5), the Group Shift key replaces the Compose Character key.

Many keys on the German keyboard have a second group of legends on the right half of their keycap. These legends are called Group-2.

To enter a single character from Group-2:

1. Press and release the Group Shift key.
2. Type the key that has the desired character on the right half of the keycap. The character appears on the screen.

Example

To type an ø:

1. Press **Group Shift**.
2. Type the key that has the ø character on the right half of the keycap:
Q ø.

To enter a series of characters from Group-2:

1. Hold down the **Group Shift** key.
2. Type the series of keys that have the desired characters on the right half of their keycaps. The characters appear on the screen.
3. When you are done typing characters from Group-2, release the **Group-Shift** key.

Invalid Sequences

When you complete a valid compose or group-shift sequence, the character appears on the screen. If you use an invalid sequence, the VT1000 cancels the sequence and sounds the warning bell.

Some compose characters require that you type the key sequence in the order listed in Table 8-2. If you do not follow the order, the sequence is invalid and the warning bell sounds. If the terminal does not display the character, repeat the sequence exactly as shown in Table 8-2.

NOTE

Pressing a function key cancels a compose or group-shift sequence without sounding the bell.

You can turn the warning bell on or off from the Customize Keyboard dialog box (Chapter 5).

Canceling or Restarting a Key Sequence

If you accidentally start a key sequence by pressing **Compose Character**, **Group Shift**, or a nonspacing diacritical key, press the **<X>** key. This immediately cancels the sequence.

If you press **Compose Character** during a compose sequence, a new three-stroke sequence starts from that point. The first sequence is canceled.

If you press any of the following keys during a key sequence, they cancel the sequence and perform their usual function:

- **Tab**
- Any top-row key
- **Enter**
- Any **Ctrl** **other key** combination

Hexadecimal Key Sequences

This feature is primarily for programmers who are familiar with character coding and hexadecimal representation.

The VT1000 uses coded character sets to exchange data with a host computer. The code for a character can be represented by a pair of hexadecimal digits. With the VT1000, you can enter any 8-bit code by pressing **Compose Character** or **Group Shift** followed by two hexadecimal digits typed on the numeric keypad.

When you press **Compose Character** or **Group Shift**, the terminal assigns hexadecimal values to the numeric keypad keys. The character set tables in Chapter 10 show you the hexadecimal values for each character in the standard character sets. Here are the values assigned to each key:

Hexadecimal Compose Keys

PF1	PF2	PF3	PF4
7	8	9	—
4	5	6	,
1	2	3	Enter
0		.	

Key Name	Hexadecimal Digit
PF1	A
PF2	B
PF3	C
PF4	D
Minus	E
Comma	F

NOTE

The 8-Bit Characters, 7-Bit Characters, and UPSS DEC Supplemental buttons in the Customize VTE General dialog box do not affect hexadecimal compose sequences.

Examples

- You can use a hexadecimal compose sequence to send the US (unit separator) control character. The hexadecimal value for US is 1F.
 1. Press or .
 2. Press on the numeric keypad.
 3. Press on the numeric keypad.
- You can use a hexadecimal compose sequence to send the DCS (device control string) character. The hexadecimal value for DCS is 90.
 1. Press or .
 2. Press on the numeric keypad.
 3. Press on the numeric keypad.

Invalid Hexadecimal Sequences

If you enter an invalid sequence, the VT1000 cancels the sequence and sounds the warning bell. You can turn the warning bell on or off from the Customize Keyboard dialog box (Chapter 5).

Table 8-2 Key Sequences for Additional Characters

Character	Sequence	Character	Sequence
"	quotation mark " (sp)	²	superscript 2 2 ^
#	number sign ++	³	superscript 3 3 ^
'	apostrophe ' (sp)	μ	micro sign / U
@	commercial at A A	¶	paragraph sign P!
[	opening bracket ( (	.	middle dot . ^
\	backslash // or / <	¹	superscript 1 1 ^
]	closing bracket))	^o	masculine ordinal O_
^	circumflex accent ^ (sp)	*	closed angle brackets >>
`	grave accent ` (sp)	¹ / ₄	fraction one-quarter 1 4
{	opening brace (-	¹ / ₂	fraction one-half 1 2
|	vertical line / ^	¿	inverted ? ??
}	closing brace) -	À	A grave `A
~	tilde ~ (sp)	Á	A acute 'A
!	inverted ! !!	Â	A circumflex ^A
¢	cent sign C / or C |	Ã	A tilde ~A
£	pound sign L- or L=	Ä	A umlaut "A
¥	yen sign Y- or Y=	Å	A ring °A or A* (degree sign)
§	section sign SO or S! or S0	Æ	A E diphthong AE
¤	currency sign XO or X0	Ç	C cedilla C,
©	copyright sign CO or C0	È	E grave `E
®	feminine ordinal A_	É	E acute 'E
«	open angle brackets < <	Ê	E circumflex ^E
°	degree sign 0 ^	Ë	E umlaut "E or E"
±	plus or minus sign + -		

Character	Sequence	Character	Sequence
Ì I grave	`I	å a ring	°a or a* (degree sign)
Í I acute	'I	æ a e diphthong	a e
Î I circumflex	^I	ç c cedilla	c , (comma)
Ï I umlaut	"I or "I	è e grave	`e
Ñ N tilde	~N	é e acute	'e
Ò O grave	`O	ê e circumflex	^e
Ó O acute	'O	ë e umlaut	"e or "e
Ô O circumflex	^O	ì i grave	`i
Õ O tilde	~O	í i acute	'i
Ö O umlaut	"O or "O	î i circumflex	^i
Œ O E diphthong*	O E	ï i umlaut	"i or "i
Ø O slash	o /	ñ n tilde	~n
Ù U grave	`U	ò o grave	`o
Ú U acute	'U	ó o acute	'o
Û U circumflex	^U	ô o circumflex	^o
Ü U umlaut	"U or "U	õ o tilde	~o
ÿ Y umlaut*	"Y or "Y	ö o umlaut	"o or "o
ß German small sharp s	ss	œ o e diphthong*	o e
à a grave	`a	ø o slash	o /
á a acute	'a	ù u grave	`u
â a circumflex	^a	ú u acute	'u
ã a tilde	~a	û u circumflex	^u
ä a umlaut	"a or "a	ü u umlaut	"u or "u
		ÿ y umlaut*	"y or "y

Character	Sequence	Character	Sequence
ISO Characters†		Ý Y acute	' Y
no break space	sp sp	ý y acute	' y
¡ broken vertical bar	| | or ! ^	Þ capital Icelandic thorn	T H
¬ logical not	- ,	þ small Icelandic thorn	t h
- soft (syllable) hyphen	- -	Ð capital Icelandic Eth	- D
® registered trademark	R O	ð small Icelandic Eth	- d
- macron	- ^	*This character is only available when you use the DEC Multinational Character Set. See the Customize VTE General dialog box (Chapter 6). †These characters are only available when you use the ISO Latin Alphabet No. 1 character set. See the Customize VTE General dialog box (Chapter 6).	
¾ three quarters	3 4		
÷ division sign	- :		
× multiplication sign	x x		
´ acute accent	' '		
¸ cedilla	, ,		
¨ diaeresis	¨ (sp) or "		

9

Printers and Modems

You can connect a printer or modem directly to your VT1000 terminal. This chapter describes the types of printers and modems you can use. The chapter also describes how to select print settings.

Printers

The VT1000 has a built-in serial printer interface that supports many draft, letter-quality, and laser printers, as well as plotters. Here are some of the Digital printers and plotters you can use with your terminal:

LA Series		Letter-Quality	Laser	Plotters
LA12	LA50	LQP02 (text only)	LN03	LJ250
LA34	LA75	LQP03 (text only)	LN03S	LJ251
LA35	LA100/LA210	LQP45	LN03 Plus	
LA36	LA120			
LA38	LA210			

Chapter 2 shows how to connect a printer to the rear of the terminal.

Changing Your Print Screen Settings

The terminal's Customize Print Screen dialog box lets you control certain printing features. To view the print screen settings, choose the Print Screen . . . menu item from the VT1000 Terminal Manager's Customize menu (Chapter 5). The Customize Print Screen dialog box appears:

Customize Print Screen

Graphics Print:

Pixel Aspect Ratio

☒ 1 to 1

☐ 2 to 1

Ribbon Or Toner Saver

☒ Positive Image

☐ Negative Image

☐ Rotate/Scale Picture

VTE Text Print:

Print Form Feed Mode

☒ Form Feed

☐ No Form Feed

Print Extent Mode

☒ Entire Page

☐ Scroll Area

Printed Data Type

☒ ASCII Only

☐ ASCII + Line Drawing

☐ All Characters

OK Apply Cancel

GSF_1049_89.RAGS

The Customize Print Screen dialog box is divided into two sections: Graphics Print and VTE Text Print.

- The Graphics Print section lets you control graphics printing operations. The VT1000 terminal lets you send a snapshot of all or

part of the screen to a local printer. This snapshot uses a sixel format. The feature lets you print any graphics that appear on the screen, including window borders and text.

- The VTE Text Print section lets you control text printing operations from a video terminal (VTE) window. The VTE text print feature lets you send text in the form of ASCII code to a local printer.

From the Customize Print Screen dialog box, you can change the following settings:

Graphics Print:

Pixel Aspect Ratio You can select the pixel aspect ratio to match the dot density of the printer you are using. A pixel aspect ratio of 1 to 1 is appropriate for most printers.

- For level 2 printers such as the LA75 or LN03, use a pixel aspect ratio of 1 to 1.
- For level 1 printers such as the LA50, use a pixel aspect ratio of 2 to 1.

Ribbon or Toner Saver Normally, screen snapshots are printed as you would expect—the image is dark and the background is light. If you have an image that fills most of the screen, this may consume a great deal of printer ribbon or toner. To reverse the dark and light portions of the printed output and save ribbon or toner, click on the Negative Image button.

Rotate/Scale Picture For wide screen images, you can have the terminal rotate and scale the image so it fits on the printed page. Click on the Rotate/Scale Picture button to automatically rotate and scale an image sent to the printer.

VTE Text Print:

Print Form Feed Mode Normally, the VT1000 terminal sends a form feed (FF) character to the printer port at the end of a print screen operation. If you do not want to send a form feed, click on the No Form Feed button.

Print Extent Mode Normally, the VT1000 sends the complete text screen (regardless of the scrolling margins) to the printer port. If you only want to send what is within the scrolling margins, click on the Scroll Area button.

Printed Data Type This feature lets you select the character sets used for printing so they match the capabilities of the attached printer.

Click on this button ...	For printers that support ...
ASCII Only	Only the ASCII character set, such as the LA34, LA36, or LA120 printers.
ASCII + Line Drawing	The ASCII set and the VT100 line drawing set, such as the LA100.
All Characters	The multinational and line drawing sets, such as the LA50 or LA75.

Printing from a Video Terminal Window

You can use a local printer connected to the printer port in one of two ways:

- You can send text and graphics as sixel images to the printer, by using the Print Screen menu item in the VT1000 Terminal Manager window.
- You can send text from a VTE window to the printer, by pressing the **F2** (Print) key.

If you are using a VTE window, you can select from three printing modes:

- Normal
- Auto print
- Printer controller

Normal Mode: Printing Text on the Screen

In normal mode, your VTE widow displays text on the screen as on a typical text terminal. You can send all or part of the text in a VTE window to the printer. To print the screen press the **F2** (Print) key.

Auto Print Mode: Printing Text from the Host System

In this mode, the VT1000 sends the current display line to the printer when the cursor moves to the next line after a line feed, form feed, vertical tab, or autowrap. Auto print mode lets you print each line of text as it is received from the host.

To turn auto print mode on or off, press **Ctrl F2** (Print). You return to normal print mode when you leave auto print mode.

You can still perform printing functions with the **F2** (Print) key in auto print mode.

Printer Controller Mode: Letting the Host Control the Printer

In this mode, the host system can send text directly to the printer, without displaying the text on the terminal's screen. You cannot select this mode from the keyboard. Applications select this mode by using programming functions (Chapter 10).

If you click on the 2-Way Printer Port button in the Customize Printer Port dialog box (Chapter 5), you can also display the text on the screen. The terminal sends characters received at the printer port back to the host.

The **F2** (Print) key does not work in printer controller mode.

Checking the Printer's Availability

The local printer is shared among video terminal (VTE) windows and the VT1000 Terminal Manager on a first-come, first-serve basis. Host applications can also check the printer status. There are four possible printer states:

- No Printer
- Printer Not Ready
- Printer Ready
- Printer Busy

No Printer If the printer status is No Printer, the VT1000 ignores all print requests. When you use the printer port as a second host port, the printer status is No Printer. The No Printer status indicates the terminal has not detected the printer port's data terminal ready (DTR) signal since power-up.

Printer Not Ready If the printer status is Printer Not Ready, the terminal accepts print requests but sends nothing to the printer until the status changes to Printer Ready.

Printer Ready When DTR comes on, the printer status is Ready. If DTR goes off, the printer status is Not Ready until it comes on again.

Printer Busy If the VT1000 Terminal Manager or another video terminal window has a print operation in progress, the printer port is treated as Not Ready. But the terminal reports a Printer Busy state.

If a VTE window selects auto print or printer controller mode, the printer port remains busy to other clients until leaving this mode. The VT1000 queues print requests and may cause clients to wait for the printer port to be Ready.

Modems

A modem lets the VT1000 communicate over a telephone line with a remote computer system. The modem converts the serial characters sent between the terminal and computer into signals that can travel over telephone lines. The modem you use with your terminal must be compatible with the modem used by the host system.

You can use a variety of modems with your VT1000, such as Digital's DF224 modem. You can also use compatible modems, such as the AT&T 103, 113, and 212 types. See Appendix B for information on ordering modems.

The VT1000 must be certified for connection to non-AT&T type modems used outside of continental North America. Your local Digital Customer Services office has information on terminal certification and use of non-AT&T type modems.

To connect an approved modem to the VT1000:

1. Connect the modem cable to the 6-pin, DEC-423 host port on the rear of the terminal.
2. Display the Customize Host Port dialog box (Chapter 5).
3. Set the transmit and receive speeds to match your modem's.

VT1000 Programming Summary

This chapter describes the control functions and commands you can use when programming a VT1000 video terminal (VTE) window. The chapter has two main sections.

- **Locator Device Commands** provides a detailed description of the commands you use to program the locator device attached to the VT1000 terminal. The locator device can be a mouse or graphics tablet.
- **VT320 Programming Summary** summarizes all the control functions described in the *VT320 Programmer Reference Manual*, as well as the VT1000 locator device commands. If you are a programmer, you can use this as a quick-reference tool.

Locator Device Commands

This section describes the commands you use to program the locator device attached to the VT1000 terminal. The locator device can be a mouse or graphics tablet. There are four locator device commands:

- Enable filter rectangle
- Enable locator reports
- Locator report
- Select locator events

Enable Filter Rectangle (DECEFR)

This control function defines the coordinates of a *filter rectangle*, then activates it. If the terminal detects that the locator is outside the filter rectangle, the terminal sends an outside rectangle event and disables the rectangle. The terminal treats filter rectangles as one-shot events. Defining a new rectangle reactivates it.

Format

CSI	<i>Pt</i>	;	<i>Pl; Pb; Pr</i>	'	w
9/11	3/?	3/11	*****	2/7	7/7

Parameters

Pt

is the top border of the filter rectangle.

Pl

is the left border.

Pb

is the bottom border.

Pr

is the right border.

Description

Pt, *Pl*, *Pb*, and *Pr* are in coordinate units specified in the last DECEFR sequence. The filter rectangle includes the borders. The origin of the rectangle is the upper-left corner (*Pt* = 1, *Pl* = 1). If you omit any parameters, they default to the current locator position. Sending DECEFR without any parameters informs the application of any locator movement (unfiltered movement).

You can redefine the rectangle at any time, even if it is already active. If you define a rectangle that does not contain the locator cursor, the terminal sends an outside rectangle report and deactivates the rectangle.

DECEFR always cancels any previous filter rectangle definition. This action ensures that there will never be an outstanding filter rectangle when an application enables locator reports.

Enable Locator Reports (DECELR)

This control function enables or disables the sending of locator reports from the VT1000 terminal to the application. When enabled, you can program individual locator events to send reports to the host. An event can be (1) movement of the locator device, or (2) the pressing or releasing of a locator button, which is called a *transition*.

Format

CSI	<i>Ps</i>	;	<i>Pu</i>	'	z
9/11	3/?	3/11	3/?	2/7	7/10

Parameters

Ps

specifies whether or not locator reports are enabled.

Ps

Meaning

- | | |
|---|---|
| 0 | Locator reports disabled (default) |
| 1 | Locator reports enabled |
| 2 | One-shot reports (Send one report, then disable.) |

Pu

specifies the coordinate units for locator reports.

Pu

Coordinate Units

- | | |
|-----------------|---------------------------|
| 0 or
omitted | Character cells (default) |
| 1 | Device physical pixels |
| 2 | Character cells |

Locator Report (DECLRP)

The terminal sends locator reports to the host when a locator event occurs. A locator event can be (1) movement of the locator device, or (2) the pressing or releasing of a locator button, which is called a transition.

When a selected trigger event occurs, such as pressing or releasing a button, the terminal sends a locator report (DECLRP) to the host. The locator report tells the host the current position of the locator and which event triggered the report.

NOTE

The terminal only sends locator reports to the host when the enable locator reports (DECELR) command is set to enabled.

Format

CSI	Pe	;	Pb; Pr; Pc; Pp	&	w
9/11	3/?	3/11	*****	2/6	7/7

Parameters

Pe

is the event code. *Pe* indicates which event caused the terminal to send this report.

Pe	Meaning
0	Request. The terminal received an explicit request for a locator report, but the locator is unavailable.
1	Request. The terminal received an explicit request for a locator report.
2	Left button down
3	Left button up
4	Middle button down
5	Middle button up
6	Right button down
7	Right button up
8	Fourth button down

178 Locator Device Commands
Locator Report (DECLRP)

- | | |
|----|-------------------------------------|
| 9 | Fourth button up |
| 10 | Locator outside of filter rectangle |

Pb

is the button code. This code is an ASCII decimal number from 0 to 15 that indicates which buttons are down. The state of the four buttons on the locator correspond to the low four bits of the decimal value. For example, 1 means the button is down.

Pb	Button Down
0	No buttons down
1	Right
2	Middle
4	Left
8	Fourth

Pr

is the row coordinate of the locator position on the page. *Pr* is encoded as an ASCII decimal value.

Pc

is the column coordinate of the locator position in the page. *Pc* is encoded as an ASCII decimal value.

Pp

is the page number of the locator position. The VT1000 does not use *Pp*, because it only has one page. *Pp* is encoded as an ASCII decimal value. If *Pp* is omitted, the terminal uses a default of 1.

Request Locator Position (DECRQLP)

This control function requests a locator position report.

Format

CSI	Ps	'	|
9/11	3/?	2/7	7/12

Parameters

Ps

Selects how the terminal sends the locator position report.

Ps	Meaning
----	---------

0 or omitted	Send a single locator position report (DECLRP).
--------------	---

1	Same as 0.
---	------------

Description

The host can explicitly request a locator report only when enable locator reports (DECLRP) is set to enabled. The request causes the terminal to immediately send a locator report to the host. The report has an event code of 1, indicating the last locator position. If the session receiving the request is not currently active, the terminal sends the last known locator position for that session. If the locator is disabled or unavailable, the report has an event code of 0.

Select Locator Events (DECSLE)

This control function selects which locator events cause the terminal to send a report to the host.

Format

CSI	<i>Ps . . . Ps</i>	'	{
9/11	*****	2/7	7/11

Parameters

Ps...Ps

are one or more parameters that select which locator events cause the terminal to send a report.

Ps	Meaning
0	Respond only to explicit host requests. (default) Also cancels any pending filter rectangle.
1	Send a report when locator buttons are pressed.
2	Do not send a report when locator buttons are pressed.
3	Send a report when locator buttons are released.
4	Do not send a report when locator buttons are released.

Description

DECSLE lets you select which locator events the terminal reports to the host. The locator can report both up and down (released and pressed) button transitions for those situations where the exact sequence of button actions is significant.

VT320 Programming Summary

This section is a summary of the control functions and commands described in the *VT320 Programmer Reference Manual*. Programmers can use this section as a quick-reference tool to program the VT1000 terminal in the video terminal extended (VTE) mode.

The section also summarizes the VT1000 locator device commands described in the first half of this chapter.

The section is divided into units that correspond to the chapters of the *VT320 Programmer Reference Manual*. For example, to find out more about **Character Encoding**, you would go to Chapter 2 of the *VT320 Programmer Reference Manual*.

Section

- 2 Character Encoding
- 3 Keyboard Codes
- 4 Emulating VT Terminals
- 5 Using Character Sets
- 6 Screen Display Commands
- 7 Visual Character and Line Attributes
- 8 Editing
- 9 Controlling the Cursor
- 10 Keyboard and Printing Commands
- Locator Device Commands
- 11 Reports
- 12 Resetting and Testing
- A VT52 Mode Control Codes

2 Character Encoding

Character Sets and Codes

Computer systems store characters as a series of bits, usually 7 bits or 8 bits per character. A bit is a binary digit. The VT1000 can work with 7-bit or 8-bit systems.

The VT1000 provides the following built-in character sets:

- ASCII
- DEC Supplemental Graphic
- ISO Latin Alphabet Nr 1 supplemental graphic
- 12 national replacement character sets (NRCs)
- DEC Special Graphic
- DEC Technical

An 8-bit system can use any of these character sets. A 7-bit system can use the ASCII, NRC, and DEC Special Graphic sets.

Code Tables

A code table is a convenient way of showing a character set and the codes for each character. This programming summary shows the code tables for the built-in character sets. This section describes the format for 7-bit and 8-bit code tables.

Code tables are divided into columns and rows. One way of finding a character is by its column/row position in the table. For example, in the ASCII character set the character *H* is at position 4/8 (column 4, row 8).

Each character in a row uses the same binary code for its four least significant bits. This value appears at the left or right of each row. Each character in a column uses the same binary code for its three (or four) most significant bits. This value appears at the top of each column.

Next to each character appears the octal, decimal, and hexadecimal code for the character. Programmers may prefer using octal, decimal, or hexadecimal values for different purposes.

Each character set has two types of characters, graphic characters and control characters. *Graphic characters* are the characters you can display on the screen. *Control characters* make the terminal perform a special function. See "Control Characters" in this programming summary.

7-Bit ASCII Code Table

The ASCII table has 128 character codes, arranged in 8 columns and 16 rows. The ASCII graphic characters are in positions 2/1 through 7/14 of the ASCII table. ASCII graphic characters include all American and

English alphanumeric characters, plus punctuation marks and various text symbols.

The ASCII control characters are in positions 0/0 through 1/15 (columns 0 and 1) of the ASCII table. The control characters are represented as mnemonics. For example CR is carriage return.

Column		0	1	2	3	4	5	6	7
b6 Bits		0	0	0	0	0	0	0	0
b7		0	0	0	0	1	1	1	1
b6		0	0	0	1	0	0	1	1
b5		0	0	1	0	1	0	1	0
b4		0	1	0	1	0	1	0	1
b3		0	1	0	1	0	1	0	1
b2		0	1	0	1	0	1	0	1
b1		0	1	0	1	0	1	0	1
Row		0	1	2	3	4	5	6	7
0	0 0 0 0	NUL	DLE	SP	0	@	P	'	p
1	0 0 0 1	SOH	DC1 (XON)	!	1	A	Q	a	q
2	0 0 1 0	STX	DC2	"	2	B	R	b	r
3	0 0 1 1	ETX	DC3 (XOFF)	#	3	C	S	c	s
4	0 1 0 0	EOT	DC4	\$	4	D	T	d	t
5	0 1 0 1	ENQ	NAK	%	5	E	U	e	u
6	0 1 1 0	ACK	SYN	&	6	F	V	f	v
7	0 1 1 1	BEL	ETB	'	7	G	W	g	w
8	1 0 0 0	BS	CAN	(	8	H	X	h	x
9	1 0 0 1	HT	EM	)	9	I	Y	i	y
10	1 0 1 0	LF	SUB	*	:	J	Z	j	z
11	1 0 1 1	VT	ESC	+	;	K	[	k	{
12	1 1 0 0	FF	FS	,	<	L	\	l	|
13	1 1 0 1	CR	GS	-	=	M	]	m	}
14	1 1 1 0	SO	RS	.	>	N	^	n	~
15	1 1 1 1	SI	US	/	?	O	_	o	DEL

← C0 Codes → ← GL Codes (ASCII Graphic) →

Key

Character

ESC	33	Octal
	27	Decimal
	1B	Hex

8-Bit Code Table

An 8-bit code table has the same number of rows as the 7-bit table, but twice as many columns and character code positions.

The codes on the left half of the 8-bit table (columns 0 through 7) work like the codes in the 7-bit table. You can use these codes in a 7-bit or 8-bit environment. The eighth bit of these codes is 0.

The codes on the right half of the table (columns 8 through 15) have an eighth bit of 1. You can only use these codes in an 8-bit environment.

The 8-bit code table has two sets of control characters, C0 (control zero) and C1 (control one). The C0 controls are in columns 0 and 1. The C0 controls are the same as the ASCII control characters in the 7-bit table. You can use C0 controls in a 7-bit environment.

The C1 controls are in columns 8 and 9. You can only use C1 controls directly in an 8-bit environment. You

can select C1 codes indirectly in a 7-bit environment. See the "Control Characters" section in this programming summary.

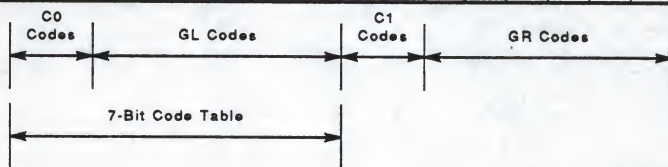
The table also has two sets of graphic characters, GL (graphic left) and GR (graphic right). There are 94 GL codes in positions 2/1 through 7/14. You can use GL codes in 7-bit or 8-bit environments.

There are 96 GR codes in positions 10/0 through 15/15. Some 8-bit character sets only use 94 of these GR codes. You can use GR codes only in an 8-bit environment.

Together, the GL and GR sets make up the terminal's *in-use table*. The in-use table contains the graphic characters the terminal uses to interpret 8-bit codes. Before the terminal can display characters from a character set, the set must be mapped into the in-use table. The *VT320 Programmer Reference Manual* describes the in-use table in detail.

VT1000 VTE Programming Summary

Column Row	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15
00	NUL	DLE	SP							DCS						
01	SOH	DC1								PU1						
02	STX	DC2								PU2						
03	ETX	DC3								STS						
04	EOT	DC4							IND	CCH						
05	ENQ	NAK							NEL	MW						
06	ACK	SYN							SSA	SPA						
07	BEL	ETB							ESA	EPA						
08	BS	CAN							HTS							
09	HT	EM							HTJ							
10	LF	SUB							VTs							
11	VT	ESC							PLD	CSI						
12	FF	FS							PLU	ST						
13	CR	GS							RI	OSC						
14	SO	RS							SS2	PM						
15	SI	US						DEL	SS3	APC						



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DEC Multinational Character Set

When you turn on or reset the terminal, you automatically select the following character sets:

ASCII in GL

DEC Supplemental Graphic (or ISO Latin-1 supplemental) in GR

Together, the ASCII set and one of the supplemental sets make up a multinational character set.

Left Half—ASCII Set

- The ASCII set and DEC Supplemental Graphic sets make up the **DEC Multinational** character set.
- The ASCII set and the ISO Latin-1 supplemental set make up the **ISO Latin Alphabet Nr 1** set.

NOTE

All control function descriptions in this manual assume that the terminal is using the DEC Multinational set.

Column		0	1	2	3	4	5	6	7
b8 Bits		0	0	0	0	0	0	0	0
b7		0	0	0	0	1	1	1	1
b6		0	0	1	1	0	0	1	1
b5		0	1	0	1	0	1	0	1
b4 b3 b2 b1									
Row									
0	0 0 0 0	NUL	DLE	SP	0	@	P	'	p
1	0 0 0 1	SOH	DC1 (XON)	!	1	A	Q	a	q
2	0 0 1 0	STX	DC2	"	2	B	R	b	r
3	0 0 1 1	ETX	DC3 (XOFF)	#	3	C	S	c	s
4	0 1 0 0	EOT	DC4	\$	4	D	T	d	t
5	0 1 0 1	ENQ	NAK	%	5	E	U	e	u
6	0 1 1 0	ACK	SYN	&	6	F	V	f	v
7	0 1 1 1	BEL	ETB	'	7	G	W	g	w
8	1 0 0 0	BS	CAN	(	8	H	X	h	x
9	1 0 0 1	HT	EM	)	9	I	Y	i	y
10	1 0 1 0	LF	SUB	*	:	J	Z	j	z
11	1 0 1 1	VT	ESC	+	;	K	[	k	{
12	1 1 0 0	FF	FS	,	<	L	\	l	|
13	1 1 0 1	CR	GS	-	=	M	]	m	}
14	1 1 1 0	SO	RS	.	>	N	^	n	~
15	1 1 1 1	SI	US	/	?	O	_	o	DEL

← C0 Codes → ← GL Codes (ASCII Graphic) →

Key

Character

ESC	33	Octal
	27	Decimal
	1B	Hex

Right Half—DEC Supplemental Graphic Set

8	9	10	11	12	13	14	15	Column
1 0 0 0	1 0 0 1	1 0 1 0	1 0 1 1	1 1 0 0	1 1 0 1	1 1 1 0	1 1 1 1	b8 b7 b6 b5 b4 b3 b2 b1
200 128 80 DCS	220 144 90 PU1	240 160 100 i	260 176 112 +	280 192 128 A	300 208 144 C	320 224 160 a	340 240 176 E	360 256 192 0
201 129 81 PU2	221 145 91 f	241 161 101 2	261 177 113 A	281 193 129 O	301 209 145 C	321 225 161 a	341 241 177 E	361 257 193 0
202 130 82 STS	222 146 92 f	242 162 102 3	262 178 114 A	282 194 130 O	302 210 146 C	322 226 162 a	342 242 178 E	362 258 194 0
203 131 83 IND	223 147 93 CCH	243 163 103 f	263 179 115 A	283 195 131 O	303 211 147 C	323 227 163 a	343 243 179 E	363 259 195 0
204 132 84 NEL	224 148 94 MW	244 164 104 Y	264 180 116 A	284 196 132 O	304 212 148 C	324 228 164 a	344 244 180 E	364 260 196 0
205 133 85 SSA	225 149 95 SPA	245 165 105 Y	265 181 117 A	285 197 133 O	305 213 149 C	325 229 165 a	345 245 181 E	365 261 197 0
206 134 86 ESA	226 150 96 EPA	246 166 106 S	266 182 118 A	286 198 134 O	306 214 150 C	326 230 166 a	346 246 182 E	366 262 198 0
207 135 87 HTS	227 151 97 HTS	247 167 107 S	267 183 119 A	287 199 135 O	307 215 151 C	327 231 167 a	347 247 183 E	367 263 199 0
208 136 88 HTJ	228 152 98 HTJ	248 168 108 C	268 184 120 A	288 200 136 O	308 216 152 C	328 232 168 a	348 248 184 E	368 264 200 0
209 137 89 VTS	229 153 99 VTS	249 169 109 C	269 185 121 A	289 201 137 O	309 217 153 C	329 233 169 a	349 249 185 E	369 265 201 0
210 138 90 PLD	230 154 100 CSI	250 170 110 a	270 186 122 A	290 202 138 O	310 218 154 C	330 234 170 a	350 250 186 E	370 266 202 0
211 139 91 PLU	231 155 101 ST	251 171 111 a	271 187 123 A	291 203 139 O	311 219 155 C	331 235 171 a	351 251 187 E	371 267 203 0
212 140 92 RI	232 156 102 OSC	252 172 112 a	272 188 124 A	292 204 140 O	312 220 156 C	332 236 172 a	352 252 188 E	372 268 204 0
213 141 93 SS2	233 157 103 PM	253 173 113 a	273 189 125 A	293 205 141 O	313 221 157 C	333 237 173 a	353 253 189 E	373 269 205 0
214 142 94 SS3	234 158 104 APC	254 174 114 a	274 190 126 A	294 206 142 O	314 222 158 C	334 238 174 a	354 254 190 E	374 270 206 0
215 143 95 SS3	235 159 105 APC	255 175 115 a	275 191 127 A	295 207 143 O	315 223 159 C	335 239 175 a	355 255 191 E	375 271 207 0

← C1 Codes → ← GR Codes (DEC Supplemental Graphic) →

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ISO Latin-1 Supplemental Character Set

This 8-bit character set has 96 graphic characters. The graphic characters are similar to those in the DEC Supplemental Graphic set. The ISO Latin-1 supplemental set includes letters with accents and diacritical marks, used in many European languages. It also has other special symbols and letters, not included in the DEC Supplemental Graphic set.

The C1 controls are in columns 8 and 9 of the ISO Latin-1 supplemental set.

The graphic characters are in columns 10 through 15.

You can select the ISO Latin-1 supplemental set as the default by using control functions ("5 Using Character Sets") or the Customize General dialog box (Chapter 6). The combination of the ASCII character set in GL and the ISO Latin-1 supplemental set in GR is called the ISO Latin Alphabet Nr 1 character set.

You can only use the ISO Latin-1 set in VT300 mode.

8	9	10	11	12	13	14	15	Column								
1 0 0	1 0 1	1 0 0	1 0 1	1 1 0	1 1 0	1 1 0	1 1 1	b8 b7 b6 b5 b4 b3 b2 b1	Row							
200 128 80	DCS	220 144 90	NBSP	240 160 A0	°	260 176 B0	À	300 192 C0	Ð	320 208 D0	à	340 224 E0	Ö	360 240 F0	0 0 0 0	0
201 129 81	PU1	221 145 91	í	241 161 A1	±	261 177 B1	Á	301 193 C1	Ñ	321 209 D1	á	341 225 E1	ñ	361 241 F1	0 0 0 1	1
202 130 82	PU2	222 146 92	ê	242 162 A2	2	262 178 B2	Â	302 194 C2	Ò	322 210 D2	â	342 226 E2	ò	362 242 F2	0 0 1 0	2
203 131 83	STS	223 147 93	£	243 163 A3	3	263 179 B3	Ã	303 195 C3	Ó	323 211 D3	ã	343 227 E3	ó	363 243 F3	0 0 1 1	3
204 132 84	IND	224 148 94	¤	244 164 A4	'	264 180 B4	Ä	304 196 C4	Ô	324 212 D4	ä	344 228 E4	ö	364 244 F4	0 1 0 0	4
205 133 85	NEL	225 149 95	¥	245 165 A5	µ	265 181 B5	Å	305 197 C5	Õ	325 213 D5	å	345 229 E5	õ	365 245 F5	0 1 0 1	5
206 134 86	SSA	226 150 96	ı	246 166 A6	¶	266 182 B6	Æ	306 198 C6	Ö	326 214 D6	æ	346 230 E6	ö	366 246 F6	0 1 1 0	6
207 135 87	ESA	227 151 97	§	247 167 A7	·	267 183 B7	Ç	307 199 C7	×	327 215 D7	ç	347 231 E7	÷	367 247 F7	0 1 1 1	7
210 136 88	HTS	230 152 98	"	250 168 A8	,	270 184 B8	È	310 200 C8	Ø	330 216 D8	ø	350 232 E8	÷	370 248 F8	1 0 0 0	8
211 137 89	HTJ	231 153 99	©	251 169 A9	1	271 185 B9	É	311 201 C9	Ù	331 217 D9	é	351 233 E9	ù	371 249 F9	1 0 0 1	9
212 138 9A	VTs	232 154 9A	à	252 170 AA	ó	272 186 BA	Ê	312 202 CA	Ú	332 218 DA	ê	352 234 EA	ú	372 250 FA	1 0 1 0	10
213 139 9B	PLD	233 155 9B	«	253 171 AB	»	273 187 BB	Ë	313 203 CB	Û	333 219 DB	ë	353 235 EB	û	373 251 FB	1 0 1 1	11
214 140 9C	PLU	234 156 9C	┐	254 172 AC	1/4	274 188 BC	Ì	314 204 CC	Ü	334 220 DC	ì	354 236 EC	ü	374 252 FC	1 1 0 0	12
215 141 9D	RI	235 157 9D	—	255 173 AD	1/2	275 189 BD	Í	315 205 CD	Ý	335 221 DD	í	355 237 ED	ý	375 253 FD	1 1 0 1	13
216 142 9E	SS2	236 158 9E	®	256 174 AE	3/4	276 190 BE	Î	316 206 CE	Þ	336 222 DE	î	356 238 EE	þ	376 254 FE	1 1 1 0	14
217 143 9F	SS3	237 159 9F	—	257 175 AF	¿	277 191 BF	Ï	317 207 CF	ß	337 223 DF	ï	357 239 EF	ÿ	377 255 FF	1 1 1 1	15

← C1 Codes → GR Codes
(ISO Latin-1 Supplemental Graphic)

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National Replacement Character (NRC) Sets

The NRC sets are 7-bit character sets for different European languages and dialects. There are 12 NRC sets. Each character set has 94 graphic characters. The NRC sets are similar to the ASCII set, but replace a few ASCII characters with characters for a given European language or dialect.

NOTE

Digital recommends that you operate the terminal in an 8-bit environment. The NRC sets are provided only for compatibility with 7-bit environments.

The following table lists the characters in each NRC set that are different from the ASCII set. To use an NRC set, you must select national replacement character set mode. You can select this mode by using a control function ("4 Emulating VT Series Terminals") or the Customize General dialog box (Chapter 6). You can only use one NRC set at a time. The NRC set used depends on the keyboard selected in Customize 7-Bit NRCS Selection dialog box, as follows:

Keyboard	NRC Set
United Kingdom	United Kingdom
Danish	Norwegian/Danish
Finnish	Finnish
Flemish	French
French/Belgian	French
French Canadian	French Canadian
German	German
Italian	Italian
Norwegian	Norwegian/Danish
Portuguese	Portuguese
Spanish	Spanish
Swedish	Swedish
Swiss (French)	Swiss
Swiss (German)	Swiss

Comparing NRCs to the U.S. ASCII Set

Character Set	2/3	4/0	5/11	5/12	5/13	5/14
ASCII	#	@	[\]	^
United Kingdom	£	@	[\]	^
Finnish	#	@	Ä	Ö	Å	Ü
French	£	à	°	ç	§	^
French Canadian	#	à	â	ç	ê	î
German	#	§	Ä	Ö	Ü	^
Italian	£	§	°	ç	é	^
Norwegian/Danish	#	@	Æ	Ø	Å	^
Portuguese	#	@	Ã	Ç	Õ	^
Spanish	£	§	í	Ñ	¿	^
Swedish	#	É	Ä	Ö	Å	Ü
Swiss	ù	à	é	ç	ê	î

Character Set	5/15	6/0	7/11	7/12	7/13	7/14
ASCII	—	`	{	|	}	~
United Kingdom	—	`	{	|	}	~
Finnish	—	é	ä	ö	å	ü
French	—	`	é	ù	è	..
French Canadian	—	ô	é	ù	è	û
German	—	`	ä	ö	ü	ß
Italian	—	ù	à	ò	è	ì
Norwegian/Danish	—	`	æ	ø	å	~
Portuguese	—	`	ã	ç	õ	~
Spanish	—	`	`	°	ñ	ç
Swedish	—	é	ä	ö	å	ü
Swiss	è	ô	ä	ö	ü	û

DEC Special Graphic Character Set

This 7-bit character set has 94 graphic characters. Most of the graphic characters are also in the ASCII character set. The other graphic characters include special symbols and line-drawing characters.

The C0 controls are in columns 0 and 1 of the DEC Special Graphic set. The graphic characters are in columns 2 through 7.

Another name for this character set is the VT100 line-drawing character set. The line-drawing characters let you create a limited range of pictures when you use the VT1000 as a text terminal.

You can use the DEC Special Graphic set to replace the ASCII set in GL or the DEC Supplemental Graphic set in GR. "5 Using Character Sets" describes how to select character sets.

Row	Column	0		1		2		3		4		5		6		7				
	Bits	0		0		0		0		1		1		1		1				
	b7	0		0		0		0		1		1		1		1				
	b6	0		0		0		1		0		0		1		0				
b5	0		0		1		0		1		0		0		1					
b4	b3	b2	b1																	
0	0	0	0	0	NUL	0 0 0	DLE	20 18 16	SP	40 38 36	0	80 48 30	@	100 64 40	P	120 80 60	↑	140 96 80	—	160 112 100
1	0	0	0	1	SOH	1 1 1	DC1 (XON)	21 17 11	!	41 33 21	1	61 49 31	A	101 85 65	Q	121 81 61	⏏	141 97 81	SCAN 3	161 113 71
2	0	0	1	0	STX	2 2 2	DC2	22 18 12	"	42 34 22	2	62 50 32	B	102 86 62	R	122 82 62	H	142 98 82	SCAN 5	162 114 72
3	0	0	1	1	ETX	3 3 3	DC3 (XOFF)	23 19 13	#	43 35 23	3	63 51 33	C	103 87 63	S	123 83 63	F	143 99 83	SCAN 7	163 116 74
4	0	1	0	0	EOT	4 4 4	DC4	24 20 14	\$	44 36 24	4	64 52 34	D	104 88 64	T	124 84 64	R	144 100 76	↑	164 118 78
5	0	1	0	1	ENQ	5 5 5	NAK	25 21 15	%	45 37 25	5	65 53 35	E	105 89 65	U	125 85 65	⏏	145 101 85	↑	165 120 76
6	0	1	1	0	ACK	6 6 6	SYN	26 22 16	&	46 38 26	6	66 54 36	F	106 90 66	V	126 86 66	°	146 102 86	⊥	166 118 76
7	0	1	1	1	BEL	7 7 7	ETB	27 23 17	'	47 39 27	7	67 55 37	G	107 91 67	W	127 87 67	+	147 103 87	T	167 119 77
8	1	0	0	0	BS	8 8 8	CAN	28 24 18	(	48 40 28	8	70 56 38	H	110 94 68	X	130 90 68	N	150 104 68	|	170 120 78
9	1	0	0	1	HT	9 9 9	EM	31 25 19	)	51 41 29	9	71 57 39	I	111 95 69	Y	131 91 69	Y	151 105 69	≤	171 121 79
10	1	0	1	0	LF	10 10 10	SUB	32 26 1A	*	52 42 2A	:	72 58 3A	J	112 96 6A	Z	132 92 6A	J	152 106 6A	≥	172 122 7A
11	1	0	1	1	VT	11 11 11	ESC	33 27 1B	+	53 43 2B	;	73 59 3B	K	113 97 6B	[	133 93 6B	l	153 107 6B	π	173 123 7B
12	1	1	0	0	FF	12 12 12	FS	34 28 1C	,	54 44 2C	<	74 60 3C	L	114 98 6C	\	134 94 6C	l	154 108 6C	≠	174 124 7C
13	1	1	0	1	CR	13 13 13	GS	35 29 1D	-	55 45 2D	=	75 61 3D	M	115 99 6D	]	135 95 6D	l	155 109 6D	£	175 125 7D
14	1	1	1	0	SO	14 14 14	RS	36 30 1E	.	56 46 2E	>	76 62 3E	N	116 100 6E	^	136 96 6E	†	156 110 6E	·	176 126 7E
15	1	1	1	1	SI	15 15 15	US	37 31 1F	/	57 47 2F	?	77 63 3F	O	117 101 6F	(BLANK)	137 97 6F	—	157 111 6F	DEL	177 127 7F

← C0 Codes → GL Codes (DEC Special Graphic) →

Key

Character

ESC

33
27
1BOctal
Decimal
Hex

DEC Technical Character Set

This 7-bit character set has 94 graphic characters. The DEC Technical set has characters and symbols often used in technical applications, such as schematic and logic diagrams.

The C0 controls are in columns 0 and 1 of the DEC Technical character set.

The graphic characters and symbols are in columns 2 through 7.

You can use the characters in positions 2/1 through 3/7 to form large composite characters.

You can use the DEC Technical set to replace the ASCII set in GL or the DEC Supplemental Graphic set in GR. You can only use the DEC Technical set in VT300 mode.

b8 b7 b6 b5 b4 b3 b2 b1							0 1		0 1		0 1		0 1		0 1		0 1	
Bits							GL GR		GL GR		GL GR		GL GR		GL GR		GL GR	
Column							2	10	3	11	4	12	5	13	6	14	7	15
Row							0		1		2		3		4		5	
0	0	0	0	0	0	0			⏏	80 280	84 192	Π	120 320	140 340	88 224	π	180 360	112 240
0	0	0	0	1	0	0	1	↓	41 241	61 261	α	101 301	Ψ	121 321	α	141 341	Ψ	181 381
0	0	0	1	0	1	0	1	↙	21 A1	41 177	31 B1	85 193	81 209	87 225	81 E1	71 F1	113 241	21 F1
0	0	1	0	0	0	0	0	↘	22 A2	82 282	50 178	102 302	122 322	β	142 342	122 322	182 382	114 242
0	0	1	0	1	0	1	1	∞	32 B2	52 182	42 C2	86 194	82 210	82 E2	72 F2	114 242	22 F2	32 F2
0	0	1	1	0	0	0	0	÷	43 243	63 263	51 179	103 303	Σ	123 323	143 343	123 323	183 383	115 243
0	0	1	1	0	1	0	1	÷	35 163	51 179	43 C3	87 195	83 211	83 E3	73 F3	115 243	35 F3	43 F3
0	1	0	0	0	0	0	0	Δ	44 244	64 264	52 180	104 304	124 324	δ	144 344	124 324	184 384	116 244
0	1	0	0	1	0	0	1	Δ	36 164	52 180	44 C4	88 196	84 212	84 E4	74 F4	116 244	36 F4	44 F4
0	1	0	1	0	0	0	0	▽	45 245	65 265	53 181	105 305	125 325	ε	145 345	125 325	185 385	117 245
0	1	0	1	0	1	0	1	▽	37 165	53 181	45 C5	89 197	85 213	85 E5	75 F5	117 245	37 F5	45 F5
0	1	1	0	0	0	0	0	Φ	46 246	66 266	54 182	106 306	126 326	φ	146 346	126 326	186 386	118 246
0	1	1	0	0	1	0	1	Φ	38 166	54 182	46 C6	90 198	86 214	86 E6	76 F6	118 246	38 F6	46 F6
0	1	1	1	0	0	0	0	Γ	47 247	67 267	55 183	107 307	127 327	γ	147 347	127 327	187 387	119 247
0	1	1	1	0	1	0	1	Γ	39 167	55 183	47 C7	91 199	87 215	87 E7	77 F7	119 247	39 F7	47 F7
1	0	0	0	0	0	0	0	~	50 250	70 270	56 184	110 310	130 330	η	150 350	130 330	190 390	120 248
1	0	0	0	1	0	0	1	~	40 188	56 184	48 C8	92 200	88 216	88 E8	78 F8	120 248	40 F8	48 F8
1	0	0	1	0	0	0	0	≡	51 251	71 271	57 185	111 311	131 331	ι	151 351	131 331	191 391	121 249
1	0	0	1	0	1	0	1	≡	41 189	57 185	49 C9	93 201	89 217	89 E9	79 F9	121 249	41 F9	49 F9
1	0	1	0	0	0	0	0	Θ	52 252	72 272	58 186	112 312	132 332	θ	152 352	132 332	192 392	122 250
1	0	1	0	1	0	0	1	Θ	42 170	58 186	50 186	94 202	90 218	90 E0	80 F0	122 250	42 F0	50 F0
1	0	1	1	0	0	0	0	×	53 253	73 273	59 187	113 313	133 333	κ	153 353	133 333	193 393	123 251
1	0	1	1	0	1	0	1	×	43 171	59 187	51 187	95 203	91 219	91 E1	81 F1	123 251	43 F1	51 F1
1	1	0	0	0	0	0	0	≤	54 254	74 274	60 188	114 314	134 334	λ	154 354	134 334	194 394	124 252
1	1	0	0	1	0	0	1	≤	44 172	60 188	52 188	96 204	92 220	92 E2	82 F2	124 252	44 F2	52 F2
1	1	0	1	0	0	0	0	=	55 255	75 275	61 189	115 315	135 335	μ	155 355	135 335	195 395	125 253
1	1	0	1	0	1	0	1	=	45 173	61 189	53 189	97 205	93 221	93 E3	83 F3	125 253	45 F3	53 F3
1	1	1	0	0	0	0	0	≥	56 256	76 276	62 190	116 316	136 336	ν	156 356	136 336	196 396	126 254
1	1	1	0	1	0	0	1	≥	46 174	62 190	54 190	98 206	94 222	94 E4	84 F4	126 254	46 F4	54 F4
1	1	1	1	0	0	0	0	≡	57 257	77 277	63 191	117 317	137 337	δ	157 357	137 337	197 397	127 255
1	1	1	1	0	1	0	1	≡	47 175	63 191	55 191	99 207	95 223	95 E5	85 F5	127 255	47 F5	55 F5

Key

Codes

Character

α	101	301
	65	193
	41	C1

Octal
Decimal
Hex

* Note: When Set is Mapped into GR Bit B8 is 1

Control Characters

Control characters control actions such as line spacing or data flow. The terminal does not display control characters.

The VT1000 has two control character sets, C0 and C1. These control character sets can be used with any of the graphic character sets. The terminal always interprets C0 and C1 control codes as defined by ANSI.

- C0—7-bit control characters, in columns 0 and 1 of the 8-bit code table
- C1—8-bit control characters, in columns 8 and 9 of the 8-bit code table

Table 10-1 lists the C0 control characters the VT1000 recognizes. Table 10-2 lists the C1 control characters the VT1000 recognizes. You can also code C1 control characters as 7-bit escape sequences. Table 10-3 lists the equivalent 7-bit sequences for 8-bit control characters. All three tables give column/row locations to help you find the characters in the character sets.

Table 10-1 C0 (7-Bit) Control Characters Recognized

Name	Mnemonic Column/Row	Function
Null	NUL 0/0	NUL has no function (ignored by the terminal).
Enquiry	ENQ 0/5	Sends the answerback message. (Customize General dialog box).
Bell	BEL 0/7	Sounds the bell tone if the bell is enabled in the Customize Keyboard dialog box.
Backspace	BS 0/8	Moves the cursor one space to the left. If the cursor is at the left margin, no action occurs.

Table 10-1 (Cont.) C0 (7-Bit) Control Characters Recognized

Name	Mnemonic Column/Row	Function
Horizontal tab	HT 0/9	Moves the cursor to the next tab stop. If there are no more tab stops, the cursor moves to the right margin. HT does not cause text to auto wrap.
Line feed	LF 0/10	Causes a line feed or a new line operation, depending on the setting of line feed/new line mode.
Vertical tab	VT 0/11	Treated as LF.
Form feed	FF 0/12	Treated as LF.
Carriage return	CR 0/13	Moves the cursor to the left margin on the current line.
Shift out (Locking shift 1)	SO (LS1) 0/14	Maps the G1 character set into GL. You designate G1 by using a select character set (SCS) control function ("5 Using Character Sets").
Shift in (Locking shift 0)	SI 0/15	Maps the G0 character set into GL. You designate G0 by using a select character set (SCS) control function ("5 Using Character Sets").
Device control 1 (XON)	DC1 1/1	Also known as XON. If XON/XFF flow control is enabled in the Customize Host Port dialog box, receiving DC1 causes the VT1000 to continue sending characters.

Table 10-1 (Cont.) C0 (7-Bit) Control Characters Recognized


Name	Mnemonic Column/Row	Function
Device control 3 (XOFF)	DC3 1/3	Also known as XOFF. If XON/XOFF flow control is enabled in the Customize Host Port dialog box, DC3 causes the VT1000 to stop sending characters. The terminal cannot resume sending characters until it receives a DC1 control character.
Cancel	CAN 1/8	Immediately cancels an escape sequence or control sequence in progress. The VT1000 does not print any error characters.
Substitute	SUB 1/10	Immediately cancels an escape sequence, control sequence, or device control string in progress. The VT1000 displays a reverse question mark for an error character.
Escape	ESC 1/11	Introduces an escape sequence. ESC also cancels any escape sequence, control sequence, or device control string in progress.
	DEL 7/15	Ignored when received. DEL is not used as a fill character. Digital does not recommend using DEL as a fill character. Use NUL instead.

Table 10-2 C1 (8-Bit) Control Characters Recognized

Name	Mnemonic Column/Row	Function
Index	IND 8/4	Moves the cursor down one line in the same column. If the cursor is at the bottom margin, a scroll up occurs.
Next line	NEL 8/5	Moves the cursor to the first position on the next line. If the cursor is at the bottom margin, a scroll up occurs.
Horizontal tab set	HTS 8/8	Sets a horizontal tab stop at the column where the cursor is.
Reverse index	RI 8/13	Moves the cursor up one line in the same column. If the cursor is at the top margin, a scroll down occurs.
Single shift 2	SS2 8/14	Temporarily maps the G2 character set into GL, for the next graphic character. You designate the G2 set by using a select character set (SCS) control function ("5 Using Character Sets").
Single shift 3	SS3 8/15	Temporarily maps the G3 character set into GL, for the next graphic character. You designate the G3 set by using a select character set (SCS) control function ("5 Using Character Sets").

Table 10-2 (Cont.) C1 (8-Bit) Control Characters Recognized

Name	Mnemonic Column/Row	Function
Device control string	DCS 9/10	Introduces a device control string.
Control sequence introducer	CSI 9/11	Introduces a control sequence.
String terminator	ST 9/12	Ends a control string. You use ST in combination with DCS, APC, OSC, PM, or SOS strings.
Operating system command	OSC 9/13	Introduces an operating system command.*
Privacy message	PM 9/14	Introduces a privacy message string.*
Application program command	APC 9/15	Introduces an application program command.*

*The VT1000 ignores all following characters, until it receives an ST control string. ESC, CAN, and SUB no longer cancel device control strings.

Table 10-3 8-Bit Control Characters and Their 7-Bit Equivalents

Name	8-Bit Character	7-Bit Sequence
Index	IND	ESC D
Next line	NEL	ESC E
Horizontal tab set	HTS	ESC H
Reverse index	RI	ESC M
Single shift 2	SS2	ESC N
Single shift 3	SS3	ESC O
Device control string	DCS	ESC P
Control sequence introducer	CSI	ESC [
String terminator	ST	ESC \
Operating system command	OSC	ESC]
Privacy message	PM	ESC ^
Application program	APC	ESC _

Control Functions

Programmers use control functions to make the VT1000 perform special actions in applications. These functions range from the simple—editing data—to the complex—reporting the terminal's operating state. The way you enter control functions in an application depends on two factors: your computing system and the programming language you use.

There are single-character and multiple-character control functions. The single-character functions are the C0 and C1 control characters. You can use C0 characters in a 7-bit or 8-bit environment. C1 characters provide a few more functions than C0 characters, but you can only use C1 characters directly in an 8-bit environment.

Multiple-character functions provide many more functions than the C0 and C1 characters. Multiple-character functions can use control characters and graphic characters. There are three basic types of multiple-character functions:

escape sequences
control sequences
device control strings

Many sequences are based on ANSI and ISO standards, and are used throughout the industry. Others are private sequences created by manufacturers like Digital for specific families of products. ANSI sequences and private sequences follow ANSI and ISO standards for control functions.

In this manual, private control functions created by Digital have the prefix DEC in their mnemonic name. For example, column mode has the mnemonic DECCOLM. All other control functions are standardized.

PROGRAMMING TIP

When you use control functions, remember that the binary codes define a function—not the graphic characters. This manual uses graphic characters from the DEC Multinational character set to show control functions. If you use another character set, the graphic characters for control functions may change, but the code is always the same.

Sequence Format

This manual shows escape and control sequences in their 8-bit format. You can also use equivalent 7-bit sequences (Table 10-3).

The 8-bit format uses the C0 and C1 control characters and ASCII characters from the DEC Multinational character set. The sequences also show each character's column/row position in the character set table, below the character. The column/row code eliminates confusion over similar looking characters such as 0 (3/0) and O (4/15).

NOTE

Spaces appear between characters in a sequence for clarity. These spaces are not part of the sequence. If a space is part of the sequence, the SP (2/0) character appears.

Escape Sequences

An escape sequence begins with the ESC character, followed by one or more graphic characters from the ASCII set. ESC is a 7-bit C0 control character. The ESC character tells the system that the graphic characters are part of a control function, not characters to be displayed. For example, the following escape sequence changes the current of text to double-width, single-height characters:

ESC # 6

Escape sequences use only 7-bit characters, but can be used in 7-bit or 8-bit systems.

Control Sequences

A control sequence begins with the CSI character, followed by two or more ASCII graphic characters. CSI is an 8-bit C1 control character. You can also express CSI as two 7-bit characters, ESC [. This means you can express control sequences as escape sequences. For example, the following two sequences perform the same function—they change the display from 80 to 132 columns per line.

CSI ? 3 H

ESC [? 3 H

Whenever possible, use CSI instead of ESC [to introduce a control sequence. You can only use CSI in 8-bit systems.

Device Control Strings

A device control string begins with the DCS character, followed by one or more ASCII graphic characters, a data string, and the ST (string terminator) character. DCS and ST are 8-bit C1 control characters. For example, the following device control string assigns the DEC Supplemental Graphic set as the user-preferred supplemental set:

DCS 0 ! u % 5 ST

3 Keyboard Codes

Codes Sent by Editing Keys

Key	Code Sent	
	VT400 Mode	VT100, VT52 Modes
Find	CSI 1 ~	The editing keys do not send codes in these two modes.
Insert Here	CSI 2 ~	
Remove	CSI 3 ~	
Select	CSI 4 ~	
Prev	CSI 5 ~	
Next	CSI 6 ~	

Codes Sent by Arrow Keys

Key	Cursor Key Mode Setting (DECCKM)		
	ANSI Mode*	VT52 Mode*	Cursor or Application
↑	CSI A	SS3 A	ESC A
↓	CSI B	SS3 B	ESC B
→	CSI C	SS3 C	ESC C
←	CSI D	SS3 D	ESC D

*ANSI mode applies to VT300 and VT100 modes. VT52 mode is not compatible with ANSI mode.

Codes Sent by Numeric Keypad Keys

Key	Numeric Keypad Mode Setting (DECNMK)			
	ANSI Mode*		VT52 Mode*	
	Numeric	Application	Numeric	Application
0	0	SS3 p	0	ESC ? p
1	1	SS3 q	1	ESC ? q
2	2	SS3 r	2	ESC ? r
3	3	SS3 s	3	ESC ? s
4	4	SS3 t	4	ESC ? t
5	5	SS3 u	5	ESC ? u
6	6	SS3 v	6	ESC ? v
7	7	SS3 w	7	ESC ? w
8	8	SS3 x	8	ESC ? x
9	9	SS3 y	9	ESC ? y
-	(minus)	SS3 m	-	ESC ? m
,	(comma)	SS3 l	,	ESC ? l †
.	(period)	SS3 n	.	ESC ? n
Enter	CR or CR LF‡	SS3 M	CR or CR LF‡	ESC ? M
PF1	SS3 P	SS3 P	ESC P	ESC P
PF2	SS3 Q	SS3 Q	ESC Q	ESC Q
PF3	SS3 R	SS3 R	ESC R	ESC R
PF4	SS3 S	SS3 S	ESC S	ESC S

*ANSI mode applies to VT300 and VT100 modes. VT52 mode is not compatible with ANSI standards.

†You cannot use these sequences on a VT52 terminal.

‡Keypad numeric mode. **[Enter]** sends the same codes as **[Return]**. You can use line feed/new line mode (LNM) to change the code sent by **[Return]**. When LNM is reset, pressing **[Return]** sends one control character (CR). When LNM is set, pressing **[Return]** sends two control characters (CR, LF).

Codes Sent by the Top-Row Function Keys

Name on Legend Strip	Key Number	Code Sent	
		VT300 mode	VT100, VT52 modes
Hold	(F1)*	—	—
Print	(F2)*	—	—
—	(F3)*	—	—
—	(F4)*	—	—
Break	(F5)*	—	—
F6	F6	CSI 1 7 ~	—
F7	F7	CSI 1 8 ~	—
F8	F8	CSI 1 9 ~	—
F9	F9	CSI 2 0 ~	—
F10	F10	CSI 2 1 ~	—
F11 (ESC)	F11	CSI 2 3 ~	ESC
F12 (BS)	F12	CSI 2 4 ~	BS
F13 (LF)	F13	CSI 2 5 ~	LF
F14	F14	CSI 2 6 ~	—
Help	F15	CSI 2 8 ~	—
Do	F16	CSI 2 9 ~	—
F17	F17	CSI 3 1 ~	—
F18	F18	CSI 3 2 ~	—
F19	F19	CSI 3 3 ~	—
F20	F20	CSI 3 4 ~	—

*F1 through F5 are local function keys that do not send codes.

Keys Used to Send 7-Bit Control Characters

Control Character Mnemonic	Code Table Position	Key Pressed With Ctrl (All Modes)	Dedicated Function Key
NUL	0/00	2 or space bar	—
SOH	0/01	A	—

Control Character Mnemonic	Code Table Position	Key Pressed With Ctrl (All Modes)	Dedicated Function Key
STX	0/02	B	—
ETX	0/03	C	—
EOT	0/04	D	—
ENQ	0/05	E	—
ACK	0/06	F	—
BEL	0/07	G	—
BS	0/08	H	F12 (BS)*
HT	0/09	I	Tab
LF	0/10	J	F13 (LF)*
VT	0/11	K	—
FF	0/12	L	—
CR	0/13	M	Return
SO	0/14	N	—
SI	0/15	O	—
DLE	1/00	P	—
DC1	1/01	Q†	—
DC2	1/02	R	—
DC3	1/03	S†	—
DC4	1/04	T	—
NAK	1/05	U	—
SYN	1/06	V	—
ETB	1/07	W	—
CAN	1/08	X	—
EM	1/09	Y	—
SUB	1/10	Z	—
ESC	1/11	3 or [	F11 (ESC)*
FS	1/12	4 or /	—
GS	1/13	5 or]	—
RS	1/14	6 or ~	—
US	1/15	7 or ?	—
DEL	7/15	8	Delete

*7-bit control characters sent in VT100 or VT52 modes only.

†7-bit control codes sent only when XON/XOFF support is off.

4 Emulating VT Series Terminals

Selecting an Operating Level (DECSCL)

Sequence	Level Selected
	<i>Level 1</i>
CSI 6 1 " p	VT100 mode
	<i>Level 4*</i>
CSI 6 n " p	VT300 mode, 8-bit controls
CSI 6 n ; 0 " p	VT300 mode, 8-bit controls
CSI 6 n ; 1 " p	VT300 mode, 7-bit controls (D)
CSI 6 n ; 2 " p	VT300 mode, 8-bit controls

*Level 4 includes levels 2 and 3. In these sequences, *n* can be 2 or 3, or 4
(D) = default

Sending C1 Controls to the Host

Sequence	Mode Before	Mode After
<i>7-Bit Controls (S7C1T)</i>		
ESC sp F	VT300 mode, 8-bit controls	VT300 mode, 7-bit controls
	VT300 mode, 7-bit controls	Same. Terminal ignores sequence.
	VT100 or VT52 mode	Same. Terminal ignores sequence.
<i>8-Bit Controls (S8C1T)</i>		
ESC sp G	VT300 mode, 8-bit controls	Same. Terminal ignores sequence.
	VT300 mode, 7-bit controls	VT300 mode, 8 bit controls
	VT100 or VT52 mode	Same. Terminal ignores sequence.

Character Set Mode (DECNRCM)

Default: Multinational

Mode	Sequence	Function
Set (national)	CSI ? 4 2 h	The terminal uses 7-bit characters from an NRC set.
Reset (multinational)	CSI ? 4 2 l*	The terminal uses 7-bit and 8-bit characters from the DEC Multinational or ISO Latin-1 set.

*The last character in the sequence is a lowercase L.

5 Using Character Sets

Selecting Graphic Character Sets

1. Designate the set as G0, G1, G2, or G3.
2. Map the designated set into the in-use table.

Designating Character Sets (SCS Sequences)

You designate a hard character set as G0 through G3 by using a select character set (SCS) escape sequence. You cannot designate a 96-character set as G0.

Format:

ESC $I_1 I_2 \dots I_n F$

I_1 , intermediate character

Designates the character set as G0, G1, G2, or G3.

I_1 Character	Code	Set Selection
94-Character Sets		
(left parenthesis	2/8	G0 (initial setting for GL)
) right parenthesis	2/9	G1
* asterisk	2/10	G2 (initial setting for GR)
+ plus sign	2/11	G3
96-Character Sets*		
- hyphen	2/13	G1
. period	2/14	G2
/ slash	2/15	G3

*You cannot designate a 96-character set into G0.

$I_2 \dots I_n F$, intermediate and final characters
Selects one of the standard character sets.

Character Set	$I_2 \dots I_n F$ Characters	Code
94-Character Sets		
ASCII (Initial G1 and G0 setting)	B	4/2
DEC Supplemental Graphic (Initial G2 and G3 setting)	%5	2/5, 3/5

Character Set	$I_2 \dots I_n F$ Characters	Code
DEC Special Graphic	0	3/0
DEC Technical	>	3/14
User-preferred supplemental	<	3/12
NRC Sets*		
ISO United Kingdom	A	4/1
DEC Finnish	5	3/5
ISO French	R	5/2
DEC French Canadian	9	3/9
ISO German	K	4/11
ISO Italian	Y	5/9
DEC Norwegian/Danish	6	3/6
ISO Norwegian/Danish	'	6/0
DEC Portuguese	%6	2/5, 3/6
ISO Spanish	Z	5/10
DEC Swedish	7	3/7
DEC Swiss	=	3/13
96-Character Sets		
ISO Latin-1 Supplemental	A	4/1

*Only one NRC set is available at a time. You must select national mode to use NRC sets. See "Character Set Mode (DECNRCM)" at the end of "4 Emulating VT Series Terminals".

Mapping Character Sets

After you designate a character set as G0, G1, G2, or G3, you must map the set into the in-use table as GL or GR. To map a set, you use *locking-shift* or *single-shift* control functions.

To use a national replacement character set, you must select national replacement character set mode. When you reset this mode, the terminal uses 7-bit and 8-bit characters from one of the multinational character sets (DEC Multinational or ISO Latin-1). When you set this mode, the terminal uses 7-bit characters from an NRC set.

See "Character Set Mode (DECNRCM)" at the end of "4 Emulating VT Series Terminals".

Locking Shifts (LS)

When you use a locking shift, the character set remains in GL or GR until you use another locking shift.

Name	Mnemonic Code		Maps...
Locking shift G0	LS0	SI	Maps G0 into GL. (default)
Locking shift G1	LS1	SO	G1 into GL.

The following locking shift functions are available only in VT400 mode.

Locking shift G1 right	LS1R	ESC ~	G1 into GR.
Locking shift G2	LS2	ESC n	G2 into GL.
Locking shift G2 right	LS2R	ESC }	G2 into GR.
Locking shift G3	LS3	ESC o	G3 into GL.
Locking shift G3 right	LS3R	ESC |	G3 into GR.

Single Shifts (SS)

You use a single shift when you want to display the next character from a different character set. A single shift maps the G2 or G3 set into GL. The character set is active for only one character. Then the terminal returns to the previous character set in GL.

Name	8-Bit Code	7-Bit Code	Function
Single shift 2	SS2	ESC N	Maps G2 into GL for the next character.
Single shift 3	SS3	ESC O	Maps G3 into GL for the next character.

Assigning User-Preferred Supplemental Sets (DECAUPSS)

Default: DEC Supplemental Graphic

Sequence	Set Selected
DCS 0 ! u % 5 ST	DEC Supplemental Graphic
DCS 1 ! u A ST	ISO Latin-1 supplemental

6 Screen Display Commands

Screen Display Sequences

Name	Mnemonic	Sequence
Send/receive mode	SRM	Set: CSI 12 h Local echo off. Reset: CSI 12 I Local echo on. (D)
Screen mode	DECSNM	Set: CSI ? 5 h Light background. Reset: CSI ? 5 I Dark background. (D)
Scrolling mode	DECSLM	Set: CSI ? 4 h Smooth scroll. (D) Reset: CSI ? 4 I Jump scroll.
Select active status display*	DECSASD	CSI Ps \$ } Ps = 0, main display. Ps = 1, status line.
Select status line type*	DECSSDT	CSI Ps \$ ~ Ps = 0, none. Ps = 2, host-writable.

*Available in VT300 mode only.

(D) = default.

Screen Format Sequences

Name	Mnemonic	Sequence
Column mode	DECCOLM	Set: CSI ? 3 h 132 columns. Reset: CSI ? 3 I 80 columns. (D)
Set top and bottom margins	DECSTBM	CSI Pt ; Pb r Pt = top line. Pb = bottom line.
Set lines per page	DECSLPP	CSI Pn t Pn = number of lines.
Set columns per page	DECSCPP	CSI Pn \$ | Pn = number of columns.
Origin mode	DECOM	Set: CSI ? 6 h Move within margins. Reset: CSI ? 6 I Move outside margins. (D)

(D) = default.

7 Visual Character and Line Attributes**Character and Line Attribute Sequences**

Name	Mnemonic	Sequence
Select graphic rendition	SGR	CSI Ps...Ps m Ps = character attribute value(s). (See the list below.)
Single-width, single-height line	DECSWL	ESC # 5
Double-width, single-height line	DECDWL	ESC # 6
Double-width, double-height line	DECDHL	ESC # 3 (top half) ESC # 4 (bottom half)

Visual Character Attribute Values

Ps	Attribute
VT100 or VT300 Mode	
0	All attributes off
1	Bold
4	Underline
5	Blinking
7	Reverse video

VT300 Mode Only

22	Bold off
24	Underline off
25	Blinking off
27	Reverse video off

8 Editing**Editing Sequences**

Name	Mnemonic	Sequence
Inserting and Deleting Text		
Insert/replace mode	IRM	Set: CSI 4 h Insert characters. Reset: CSI 4 I Replace characters. (D)
Delete line	DL	CSI Pn M Pn lines.
Insert line	IL	CSI Pn L Pn lines.
Delete character	DCH	CSI Pn P Pn characters.
Insert character	ICH	CSI Pn @ Pn characters.
Erasing Text		
Erase in display	ED	CSI Ps J Ps = 0, cursor to end. (D) Ps = 1, beginning to cursor. Ps = 2, complete display.
Erase in line	EL	CSI Ps K Ps = 0, cursor to end. (D) Ps = 1, beginning to cursor. Ps = 2, complete line.

(D) = default.

Name	Mnemonic	Sequence
Erasing Text		
Erase character*	ECH	CSI Pn X Pn characters.
Selectively Erasing Text		
Select character protection attribute*	DECSA	CSI Ps " q
	Ps =	0, DECSED and DECSEL can erase. (D)
	Ps =	1, DECSED and DECSEL cannot erase.
	Ps =	2, DECSED and DECSEL can erase.
Selective erase in display*	DECSED	CSI ? Ps J
	Ps =	0, cursor to end. (D)
	Ps =	1, beginning to cursor.
	Ps =	2, complete display.
Selective erase in line*	DECSEL	CSI ? Ps K
	Ps =	0, cursor to end. (D)
	Ps =	1, beginning to cursor.
	Ps =	2, complete line.

*Available in VT300 mode only.
(D) = default.

9 Controlling the Cursor

Cursor Movement Sequences

Name	Mnemonic	Sequence
Enabling the Cursor		
Text cursor enable mode	DECTCEM	Set: CSI ? 25 h Visible cursor. (D) Reset: CSI ? 25 I Invisible cursor.
Moving the Cursor*		
Cursor position	CUP	CSI Pl ; Pc H Line Pl, column Pc.
Horizontal and vertical position	HVP	CSI Pl ; Pc f Line Pl, column Pc.
Cursor forward	CUF	CSI Pn C Pn columns right.
Cursor backward	CUB	CSI Pn D Pn columns left.
Cursor up	CUU	CSI Pn A Pn lines up.
Cursor down	CUD	CSI Pn B Pn lines down.

*In these sequences, the default value for Pn, Pl, and Pc is 1.
(D) = default.

10 Keyboard and Printing Commands

Keyboard Control Sequences

Mode	Mnemonic	Sequence	
		Set	Reset
Keyboard action	KAM	CSI 2 h Locked.	CSI 2 l Unlocked. (D)
Line feed/ new line	LNМ	CSI 20 h New line.	CSI 20 l Line feed. (D)
Autorepeat	DECARM	CSI ? 8 h Repeat.	CSI ? 8 l No repeat.
Autowrap	DECAWM	CSI ? 7 h Autowrap.	CSI ? 7 l No autowrap. (D)
Cursor keys	DECCKM	CSI ? 1 h Application.	CSI ? 1 l Cursor. (D)
Keypad application/ numeric	DECKPAM and DECKPNM	ESC = Application.	ESC > Numeric. (D)
Numeric keypad	DECNKM	CSI ? 66 h Application.	CSI ? 66 l Numeric. (D)
Keyboard usage	DECKBUM	CSI ? 68 h Data processing.	CSI ? 68 l Typewriter. (D)

(D) = default.

Programming UDKs

Definable Keys

F6 through F14 Help
Do F17 through F20

DECUDK Device Control String Format

DCS *Pc* ; *Pl* | *Ky1/St1* ; ... *Kyn/Stn* ST

Pc is the *clear parameter*.

0 or none = Clear all keys before loading new values (default)

1 = Clear one key at a time, before loading a new value.

Pl is the *lock parameter*.

0 or none = Lock the keys.

1 = Do not lock the keys.

Ky1/St1 ; ... *Kyn/Stn* are the *key definition strings*.

The key selector number (*Kyn*) indicates which key you are defining.

Key	Value	Key	Value	Key	Value
F6	17	F11	23	Do	29
F7	18	F12	24	F17	31
F8	19	F13	25	F18	32
F9	20	F14	26	F19	33
F10	21	Help	28	F20	34

The string parameters (*Stn*) are the key definitions, encoded as pairs of hex codes.

3/0 through 3/9 (0 through 9)

4/1 through 4/6 (A through F)

6/1 through 6/6 (a through f)

Printing Control Sequences

Name	Mnemonic	Sequence
Printer extent mode	DECPEX	Set: CSI ? 19 h Screen. Reset: CSI ? 19 I Scrolling region. (D)
Print form feed mode	DECPFF	Set: CSI ? 18 h Form feed. Reset: CSI ? 18 I No form feed. (D)
Autoprint mode	MC	On: CSI ? 5 I Off: CSI ? 4 I
Printer controller mode	MC	On: CSI 5 I Off: CSI 4 I
Print screen	MC	CSI I or CSI 0 I
Print cursor line	MC	CSI ? 1 I
Send line attributes	—	
Single-width		ESC # 5
Double-width		ESC # 6
Double-width/double-height		
Top half		ESC # 3
Bottom half		ESC # 4
Send visual character attributes	—	
Clear all attributes		ESC [0 m
Set attributes		ESC [0; Ps; Ps; ... Ps m Ps = attribute. See text.

(D) = default.

— Locator Device Commands

Name	Sequence	Mnemonic
Enable filter rectangle	DECEFR	CSI Pt; Pl; Pb; Pr ' w
	Pt =	top border.
	Pl =	left border.
	Pb =	bottom border.
	Pr =	right border.
Enable locator reports	DECELR	CSI Ps; Pu ' z
	Ps =	reports enabled or disabled.
	0 =	disabled (D).
	1 =	enabled.
	2 =	one-shot reports.
	Pu =	coordinate units.
	0 =	character cells (D).
	1 =	device physical pixels.
	2 =	character cells.

Name	Sequence	Mnemonic
Locator report	DECLRP	CSI <i>Pe</i> ; <i>Pb</i> ; <i>Pr</i> ; <i>Pc</i> ; <i>Pp</i> & <i>w</i>
	<i>Pe</i>	= event code.
	0	= explicit request, not available.
	1	= explicit request.
	2	= left button down.
	3	= left button up.
	4	= middle button down.
	5	= middle button up.
	6	= right button down.
	7	= right button up.
	8	= fourth button down.
	9	= fourth button up.
	10	= locator outside of filter rectangle.
	<i>Pb</i>	= button code.
	0	= no buttons down.
	1	= right.
	2	= middle.
	4	= left.
	8	= fourth.
	<i>Pr</i>	= row coordinate.
	<i>Pc</i>	= column coordinate.
	<i>Pp</i>	= page number.

Name	Sequence	Mnemonic
Request locator position (Host to VT1000)	DECRQLP	CSI <i>Ps</i> ' |
	<i>Ps</i>	= 0 or 1, send one report.
Select locator events	DECSLE	CSI <i>P...P</i> ' {
	<i>P...P</i>	= event(s).
	0	= explicit request.
	1	= buttons pressed.
	2	= no report when buttons pressed.
	3	= buttons released.
	4	= no report when buttons released.
(D) = default.		

11 VT1000 Reports

Sequences for VT1000 Reports

Name	Mnemonic	Sequence
Primary Device Attributes		
Primary DA request (Host to VT1000)	DA	CSI c or CSI 0 c
Primary DA response (VT1000 to host)	DA	CSI ? Psc; Ps1; ... Psn c
	Psc	= operating level.
	61	= level 1 (VT100 family).
	62,	= levels 2 and 3
	63	(VT300 mode).
	Ps1...Psn	= extensions.
	1	= 132 columns.
	2	= printer port.
	3	= ReGIS graphics.
	4	= sixel graphics.
	6	= selective erase.
	7	= soft character set.
	8	= user-defined keys.
	9	= NRC sets.
	11	= 25th status line.
	14	= 8-bit architecture.
	15	= DEC technical set.
	16	= ReGIS locator.
	17	= terminal state reports.
	29	= ANSI text locator.
	39	= page memory extension.

See Table 10-4 for alias responses.

Secondary Device Attributes

Secondary DA request (Host to VT1000)	DA	CSI > c or CSI > 0 c
Secondary DA response (VT1000 to host)	DA	CSI > Pp; Pv; Po c
	Pp	= identification code.
	42	= VT1000 terminal emulator.
	28	= DECterm.
	24	= VT320.
	Pv	= firmware version.
	Po	= hardware options.
	0	= no options.

Device Status Reports

VT1000 Operating Status

Request (Host to VT1000)	DSR	CSI 5 n
Report (VT1000 to host)	DSR	CSI 0 n No malfunction. CSI 3 n Malfunction.

Cursor Position Report

Request (Host to VT1000)	DSR	CSI 6 n
Report (VT1000 to host)	CPR	CSI Pl; Pc R
	Pl	= line number.
	Pc	= column number.

Name	Mnemonic	Sequence
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Device Status Reports		
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Printer Status		
----------------	--	--

Request (Host to VT1000)	DSR	CSI ? 15 n
--------------------------------	-----	------------

Report (VT1000 to host)	DSR	CSI ? 13 n No printer. CSI ? 10 n Printer ready. CSI ? 11 n Printer not ready. CSI ? 18 n Printer busy.
-------------------------------	-----	--

UDK Status (VT300 Mode Only)		
------------------------------	--	--

Request (Host to VT1000)	DSR	CSI ? 25 n
--------------------------------	-----	------------

Report (VT1000 to host)	DSR	CSI ? 20 n UDKs unlocked. CSI ? 21 n UDKs locked.
-------------------------------	-----	--

Keyboard Dialect		
------------------	--	--

Request (Host to VT1000)	DSR	CSI ? 26 n
--------------------------------	-----	------------

Report (VT1000 to host)	DSR	CSI ? 27; Pd n
-------------------------------	-----	----------------

Name	Mnemonic	Sequence
------	----------	----------

Device Status Reports		
-----------------------	--	--

Pd	=	keyboard dialect.
1	=	North American.
2	=	British.
3	=	Flemish.
4	=	French Canadian.
5	=	Danish.
6	=	Finnish.
7	=	German.
8	=	Dutch.
9	=	Italian.
10	=	Swiss French.
11	=	Swiss German.
12	=	Swedish.
13	=	Norwegian.
14	=	French/Belgian.
15	=	Spanish.
16	=	Portuguese.
28	=	Canadian (English).

Locator Device (VT300 Mode Only)		
----------------------------------	--	--

Request (Host to VT1000)	DSR	CSI ? 55 n
--------------------------------	-----	------------

Report (VT1000 to host)	DSR	CSI ? 53 n No locator device. CSI ? 50 n Locator device ready. CSI ? 58 n Locator device busy.
-------------------------------	-----	---

Name	Mnemonic	Sequence
------	----------	----------

Terminal State Reports (VT300 Mode Only)		
--	--	--

Request (Host to VT1000)	DECRQTSRCSI	Ps \$ u
	Ps	= report requested.
	0	= ignored.
	1	= terminal state report.

Terminal state report (VT1000 to host)	DECTSR	DCS 1 \$ s D..D ST
	D...D	= report data.

Restore terminal state	DECRSTS	DCS Ps \$ p D...D ST
	Ps	= data string format.
	0	= error.
	1	= terminal state report.
	D...D	= restored data.

Presentation State Reports (VT300 Mode Only)		
--	--	--

Request (Host to VT1000)	DECRQPSRCSI	Ps \$ w
	Ps	= report requested.
	0	= error.
	1	= cursor information report.
	2	= tab stop report.

Cursor information report (VT1000 to host)	DECCIR	DCS 1 \$ u D...D ST
	D..D	= data string. See text for description.

Tab stop report (VT1000 to host)	DECTABSR	DCS 2 \$ u D...D ST
	D...D	= tab stops.

Restore presentation state	DECRSPS	DCS Ps \$ t D...D ST
	Ps	= data string format.
	0	= error.
	1	= cursor information report.
	2	= tab stop report.
	D...D	= data string.

Name	Mnemonic	Sequence
Mode Settings (VT300 Mode Only)		
Request mode (Host to VT1000)	DECRQM	CSI Pa \$ p
	Pa =	ANSI mode. (Table 10-5)
		CSI ? Pd \$ p
Report mode (VT1000 to host)	Pd =	DEC private mode. (Table 10-6)
	DECRPM	CSI Pa; Ps \$ y
	Pa =	ANSI mode. (Table 10-5)
	Ps =	mode state.
	0 =	unknown mode.
	1 =	set.
	2 =	reset.
	3 =	permanently set.
	4 =	permanently reset.
Set mode	SM	CSI Pa; ... Pa h
	Pa =	ANSI mode(s). (Table 10-5) CSI ? Pd; ... Pd h
Reset mode	Pd =	DEC private mode(s). (Table 10-6)
	RM	CSI Pa; ... Pa l
	Pa =	ANSI mode(s). (Table 10-5) CSI ? Pd; ... Pd l
	Pd =	DEC private mode(s). (Table 10-6)

Name	Mnemonic	Sequence
Control Function Settings (VT300 Mode Only)		
Request (Host to VT1000)	DECRQSS	DCS \$ q D...D ST
	D..D =	intermediate and/or final characters of function. (Table 10-7)
Report (VT1000 to host)	DECRPSS	DCS Ps \$ r D...D ST
	Ps =	0, valid request.
	Ps =	1, invalid request.
	D..D =	intermediate and/or final characters of function. (Table 10-7)

Saving and Restoring the Cursor State

Save cursor state	DECSC	ESC 7
Restore cursor state	DECRC	ESC 8

User-Preferred Supplemental Set (VT300 Mode)

Request (Host to VT1000)	DEC- RQUPSS	CSI & u
Report (VT1000 to host)	DEC- AUPSS	DCS 0 ! u % 5 ST DEC Supplemental Graphic
		DCS 1 ! u A ST ISO Latin-1 supplemental

Table 10-4 Primary DA Alias Responses from the VT1000

Terminal	Identification Sequence	Meaning
VT100 DA	ESC [? 1; 2 c	VT100 terminal
VT101 DA	ESC [? 1; 0 c	VT101 terminal
VT102 DA	ESC [? 6 c	VT102 terminal
VT220 DA	CSI ? 62; 1; 2; 6; 7; 8; 9; 14 c	VT220 terminal
VT320 DA	CSI ? 63; 1; 2; 6; 7; 8; 9; 14 c	VT320 terminal
VT1000 DA	CSI ? 63; 1; 2; 6; 8; 9; 15; 29; 39 c	VT1000 terminal
DECterm DA	CSI ? 63; 1; 3; 4; 6; 7; 8; 9; 14; 15; 16; 29 c	DECterm emulator

NOTE

To change an alias response, you must use the Customize General dialog box (Chapter 6).

Table 10-5 ANSI Modes for DECRQM, DECRPM, SM, and RM

Mode	Mnemonic	Pa
Guarded area transfer	GATM*	1
Keyboard action	KAM	2
Control representation	CRM†	3
Insert/replace	IRM	4
Status reporting transfer	SRTM*	5
Erase	ERM	6
Vertical editing	VEM*	7
Horizontal editing	HEM*	10
Positioning unit	PUM*	11
Send/receive	SRM	12
Format effector action	FEAM*	13
Format effector transfer	FETM*	14
Multiple area transmit	MATM*	15
Transmit termination	TTM*	16
Selected area transfer	SATM*	17
Tabulation stop	TSM*	18
Editing boundary	EBM*	19
Line feed/new line	LNM	20

*This control function is permanently reset.

†The host cannot change the setting of CRM. You can only change CRM from set-up. If CRM is set, the terminal ignores DECRQM and most other control functions.

Table 10-6 DEC Private Modes for DECRQM, DECRPM, SM, and RM

Mode	Mnemonic	Pd
Cursor keys	DECCKM	1
ANSI	DECANM	2
Column	DECCOLM	3
Scrolling	DECSCLM	4
Screen	DECSCLNM	5
Origin	DECOM	6
Autowrap	DECAWM	7
Autorepeat	DECARM	8
Print form feed	DECPFF	18
Printer extent	DECPEX	19
Text cursor enable	DECTCEM	25
National replacement character set	DECNRCM	42
Numeric keypad	DECNKM	66
Backarrow key	DECBKM	67
Keyboard usage	DECKBUM	68

Table 10-7 Control Functions for DECRQSS Requests

Control Function	Mnemonic	Intermediate and Final Character(s)
Select active status display	DECSASD	\$ }
Set character attribute	DESCA	" q
Set conformance level	DECSCL	" p
Set status line type	DECSSTD	\$ ~
Set top and bottom margins	DECSTBM	r
Set lines per page	DECSLPP	t
Set lines per column	DECSLPP	\$ |
Select graphic rendition	SGR	m
Enable locator reports	DECELR	' z
Enable filter rectangles	DECEFR	' w
Select locator events	DECSLE	' {

12 Resetting and Testing the Terminal

Resetting and Testing Sequences

Name	Mnemonic	Sequence
Resetting the Terminal		
Soft terminal reset*	DECSTR	CSI ! p
Reset to initial state	RIS	ESC c Not recommended.
Tabulation clear	TBC	CSI 0 g Clear tab at cursor position. CSI 3 g Clear all tabs.

Testing the Terminal

See the *VT1000 Service Guide*.

*Available in VT300 mode only.

Soft Terminal Reset (DECSTR) States

Mode	Mnemonic	State After DECSTR
Text cursor enable	DECTCEM	Cursor enabled.
Insert/replace	IRM	Replace.
Origin	DECOM	Absolute (cursor origin at upper-left of screen).
Autowrap	DECAWM	No autowrap.
National replacement character set	DECNRCM	Multinational set.
Keyboard action	AM	Unlocked.
Numeric keypad	DECNKM	Numeric characters.
Cursor keys	DECKM	Normal (arrow keys).

Other Control Functions

Set top and bottom margins	DECSTBM	Top margin = 1. Bottom margin = page length.
All character sets	G0, G1, G2, G3, GL, GR	VT420 default settings. (DECSTR works only in VT400 mode.)
Select graphic rendition	SGR	Normal rendition.

Mode	Mnemonic	State After DECSTR
Select character attribute	DECSCA	Normal (erasable by DECSEL and DECSED).
Save cursor state	DECSC	Home position with VT420 defaults.
Assign user-preferred supplemental set	DECAUPSS	Set selected in set-up.
Select active status display	DECSASD	Main display (first 24 lines).

A VT52 Mode Control Codes

Sequence	Action
ESC A	Cursor up.
ESC B	Cursor down.
ESC C	Cursor right.
ESC D	Cursor left.
ESC F	Enter graphics mode.
ESC G	Exit graphics mode.
ESC H	Move the cursor to the home position.
ESC I	Reverse line feed.
ESC J	Erase from the cursor to the end of the screen.
ESC K	Erase from the cursor to the end of the line.
ESC Y P _n	Move the cursor to column P _n .
ESC Z	Identify. (host to terminal)
ESC / Z	Report. (terminal to host)
ESC =	Enter alternate keypad mode.
ESC >	Exit alternate keypad mode.
ESC <	Exit VT52 mode. (Enter VT100 mode.)
ESC ^	Enter autoprint mode.
ESC _	Exit autoprint mode.
ESC W	Enter printer controller mode.
ESC X	Exit printer controller mode.
ESC]	Print the screen.
ESC V	Print the line with the cursor.

11

Solving Problems And Getting Service

This chapter describes some simple operating problems you can solve yourself. The chapter also includes sections on:

- The VT1000 power-up self-test
- Error messages
- How to get service

Operating Problems

Table 11-1 lists some possible operating problems and suggested solutions. If you have a problem with your terminal, check this list before calling for service. If the problem persists and you need service, see "Digital Service" in this chapter.

Table 11-1 Operating Problems

Symptom	Possible Cause	Suggested Solution
System Box Problems		
The system box fan is off.	The power cord is not plugged into the power outlet.	Make sure the power cord is plugged in and check the power source.
	The system box's <input type="checkbox"/> I/O power switch is off (O).	Turn the system box power switch on (I).
Monitor Problems		
When you turn the terminal on, the monitor does not display the VT1000 Terminal Manager window after 45 seconds.	The monitor's <input type="checkbox"/> I/O power switch is off (O).	Turn the monitor's power switch on (I).
	The monitor cable is not connected to the system box.	Check the monitor cable connections.
	The monitor's brightness and contrast settings are too dark to see the screen display.	Adjust the monitor's brightness and contrast controls. See the monitor's installation guide.
	The keyboard cable is not connected.	Check the keyboard cable connections.
The screen is blank, but the terminal is on.	The monitor's fuse is blown.	Replace the fuse.
	The CRT saver feature may be on.	Check if the two keyboard lights are blinking, which may indicate the CRT saver is on. If the CRT saver is on, press any key to reactivate the screen.
The screen is distorted or the text font size is too small.	The monitor select switch is set to the wrong position.	Check the monitor select switch setting on the back of the system box.

Table 11-1 (Cont.) Operating Problems

Symptom	Possible Cause	Suggested Solution
Mouse Problems		
The pointer for the mouse or tablet does not appear on the screen, or the pointer does not respond to the pointing device commands.	The cable for the mouse or tablet is not connected securely to the system box.	Turn the system box's <input type="checkbox"/> power switch off (O), then disconnect and reconnect the mouse or tablet cable. Turn the system box's <input type="checkbox"/> power switch on (I).
Keyboard Problems		
The bell tone does not sound when you turn the VT1000 on. All keyboard indicator lights are off.	The keyboard cable is not connected.	Check the keyboard cable connection to the system box.
Keys do not work.	The <input type="checkbox"/> (Hold) key is active.	Press the <input type="checkbox"/> (Hold) key to release the screen.
Printer Problems		
The printer does not print.	The printer's <input type="checkbox"/> power switch is off (O).	Turn the printer's power switch on (I).
	The printer cable is not connected securely.	Check the printer cable connections.
	The communication settings on the terminal and printer do not match.	Make sure the communication settings (baud rate and parity) on the terminal and printer match. Choose the Customize Communications menu item from the Local Terminal Manager's Customize Menu (Chapter 5.)

Table 11-1 (Cont.) Operating Problems

Symptom	Possible Cause	Suggested Solution
Network Problems		
The host system and terminal do not communicate.	The ThinWire Ethernet cable is not connected securely to the system box.	Check the Ethernet cable and T-connector connections.
	There is no T-connector between the connector on the ThinWire cable and the system box.	Check that there is a T-connector between the connector on the ThinWire cable and the system box.
	There is a ThinWire segment between the system box and the T-connector.	Check that there is no ThinWire segment between the system box and the T-connector. (The T-connector must attach directly to the system box).
	A T-connector with a terminator has been disconnected from an operating ThinWire Ethernet segment.	Check if a terminator has been removed or disconnected from an active ThinWire segment.
	The system box port is inactive.	Make sure the port that your system cable is connected to is active.

Power-Up Self-Test

Every time you turn the terminal on, the VT1000 automatically runs a power-up self-test. This test checks the operating status of many internal parts in the terminal. During the test, the keyboard lights turn on and off. The power-up self-test should not take more than 45 seconds to complete.

If the test is successful, the bell tone sounds and the terminal displays the VT1000 Terminal Manager window.

If there were any test errors:

- A diagnostic message appears.
- The keyboard lights flash.
- The keyboard bell does not sound.

Screen Error Messages

If the VT1000 fails the power-up self-test, the terminal may display one of the error messages shown. Only qualified service personnel should try to correct these problems. You should note any error message that appears and call Digital Customer Services.

Internal error or CPU error - 11
External ROM error - 12
External RAM error - 13
NVR error - 14
Host port error - 15
Printer port error - 16
DUART1 timer error - 17
Keyboard port error - 18
Mouse port error - 19
DUART2 timer error - 21
Video RAM error - 22
Ethernet ROM error - 23
Ethernet port error - 24
Video error - 25
Mouse error - 26
Keyboard error - 27
Trap interrupt error - 28
Video control register error - 29
I/O data path error - 31
Illegal monitor error - 32
LANCE not reset on power up - 33

Digital Service

Digital provides a wide range of maintenance programs that cover small systems and terminals. These include on-site, carry-in, and mail-in maintenance services. You can use these programs to select the plan that suits your service needs.

Digital provides on-site repair and off-site repair services.

On-Site Hardware Services

Digital offers fast, low-cost, quality maintenance performed at your site by Digital-trained Service Specialists. There are several on-site services available.

DECservice

DECservice provides preferred on-site service, with a guaranteed response time when equipment is located within a specified distance of the service facility. DECservice guarantees a continuous repair effort until service is restored. You can choose the hours of coverage, up to 24 hours a day, 7 days a week.

Basic

Basic offers priority response during regular business hours, Monday through Friday.

Site SERVICenter

If you have a least 50 terminals and can provide workspace at your site, Digital will provide an on-site technician for a predetermined, periodic time interval. The terminals may include a variety of models (for example, VT200s and VT300s.)

Per Call

This noncontractual offering provides on-site repair based on time and materials. Per call service is available during regular business hours, Monday through Friday.

DECall

DECall is similar to per call service, but has an annual retainer fee. DECall gives you on-site service at a fixed fee per repair call.

Off-Site Hardware Services

Digital also provides several options for off-site service.

Carry-in SERVICenter

Digital SERVICenters are located in major cities around the world. They offer convenient, cost-effective repair service with a 48 hour turnaround time. Both contract and per call coverage is offered.

DECmailer

This is a mail-in service for module and subassembly repairs. DECmailer provides five day turnaround.

Software Services

DECsupport

This program provides telephone and on-site remedial support (if required), with personalized account focus and scheduled preventive maintenance. Software updates, new releases, and access to Digital's Software Information Network (DSIN) are included where available.

Basic

Basic service includes telephone support, software updates, new releases, and access to DSIN where available.

Self-Maintenance Service

This service provides software updates and new releases.

How To Get Service

Digital has a central service center in your area to help you keep your system running at peak efficiency. To find out more about Digital's hardware and software service offerings

In the United States

Call 1-800-554-3333 during regular business hours.

Outside the United States

Contact your local Digital Customer Services Office.

A

Specifications

This appendix lists the specifications for the VT1000 video terminal.

Site Planning

	Weight	Height	Width	Depth
System box	5.4 kg (12 lb)	394 mm (2.38 in)	369 mm (15.5 in)	403 mm (14.5 in)
VR150 monitor	16.34 kg (36 lb)	394 mm (15.5 in)	369 mm (15.9 in)	403 mm (14.5 in)
VR262 monitor	18 kg (40 lb)	394 mm (15.5 in)	455 mm (17.9 in)	395 mm (15.4 in)
VRE01 monitor	7.7 kg (15 lb)	390 mm (15.3 in)	430 mm (16.8 in)	70 mm (2.75 in)
LK401 keyboard	1.4 kg (3.1 lb)	44.6 mm (1.75 in)	479 mm (18.8 in)	191 mm (7.5 in)
Mouse	Weight 0.17 kg (0.4 lb)	Height 38 mm (1.6 in)	Diameter 83 mm (3.5 in)	

Environment

	Operating	Storage
Temperature	10° to 40° C (50° to 104° F)	-40° to 66° C (-40° to 151° F)
Relative humidity	10% to 90%	0% to 95%
Maximum wet bulb	28° C (82° F)	
Minimum dew point	2° C (36° F)	
Maximum altitude	24 km (8000 ft)	9.1 km (30,000 ft)

Electrical


Line voltage (U.S.)	100 to 120 Vac nominal 88 to 132 Vrms operating range single-phase, 3-wire
Line voltage (Europe)	220 to 240 Vac nominal 176 to 264 Vrms operating range single phase, 3-wire
Line frequency	50 to 60 Hz
Input power	60 W maximum
Power cord	Detachable, 3-conductor, grounded
Power cord receptacle	EIA specified CEE22-6A

Display

VR150 CRT	381 mm (15 inch) monochrome screen
VR150 resolution	100 dots/inch
VR262 CRT	482 mm (19 inch) monochrome screen
VR262 resolution	75 dots/inch
VRE01 flat panel	482 mm (19 inch) electroluminescent monochrome screen

LK401 Keyboard

General

General	108 sculptured keys with matte finish Available in 16 language dialects and 15 word processing versions, including English. Three French language keyboards.
Cord	1.8 m (6 ft) coiled cord with a 4-pin telephone-type modular connector
Indicator lights	2 keyboard indicators: <div style="display: flex; align-items: center; justify-content: center;"> <div style="border: 1px solid black; border-radius: 50%; width: 20px; height: 20px; margin-right: 10px;"></div> <div>Hold</div> </div> <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;"> <div style="text-align: center; margin-right: 10px;">  </div> <div>Lock</div> </div>

Keys	(Approximate Size)
Home row	30 mm (1.18 in) above desktop
Key size	13 mm (0.50 in) square
Key spacing	19 mm (0.75 in) center to center (for single-width keys)
Numeric keypad	18 keys
Function keys	5 predefined keys, 15 user-definable keys

Audible Indicators

Keyclick	Sounds after each keystroke.
Margin bell	Rings once when cursor approaches right margin.
Warning bell	Rings for compose errors and system messages.

B

Options and Documentation

You can order the following options, modems, cables, and manuals for the VT1000 video terminal from Digital. See the end of this appendix for ordering information.

Optional Memory Boards

Option	Part Number	Description
Memory controller board	VX10X-MA	Controller board for optional RAM memory (comes with a 1 megabyte SIMM card preinstalled)
SIMM card	VX10X-MD	1 megabyte SIMM card

Modems

Part Number	Description
DF242 Scholar Plus	300, 1200, and 2400 baud, full-duplex asynchronous
DF224	300, 1200, and 2400 baud, full-duplex asynchronous
DF124	300, 600, and 1200 baud, full-duplex asynchronous

Cables

Part Number	Length	Connector
Communication Cables		
BC16E-10	10 ft (3 m)	6-pin M DEC-423
BC16E-25	25 ft (7.6 m)	6-pin M DEC-423
AC Power Cables		
	Country	
BN20V-2E	Australia, New Zealand	
BN20S-2E	Austria, Belgium, Finland, France, Germany, Netherlands, Norway, Portugal, Spain, Sweden	
BN20P-2E	Canada	
BN20U-2E	Denmark	
BN20R-2E	Ireland, United Kingdom	
BN19U-2E	Israel	
BN20W-2E	Italy	
BN20T-2E	Switzerland	

Related Documentation

You can order the following related documents from Digital:

<i>VMS DECwindows User's Guide</i>	AA-MG18A-TE
Provides information on how to use DECwindows software in a VMS environment.	
<i>VT1000 Service Guide</i>	EK-V1000-PS
Provides qualified service personnel with information to troubleshoot and repair the VT1000 terminal.	
<i>VT320 Programmer Reference Manual</i>	EK-VT320-RM
Provides information on how to program the VT1000 in the video terminal extended (VTE) mode.	
<i>VR150 Pocket Service Guide</i>	EK-VR150-PS
Provides qualified service personnel with information to troubleshoot and repair the VR150 monitor.	
<i>VR262 Pocket Service Guide</i>	EK-VR262-PS
Provides qualified service personnel with information to troubleshoot and repair the VR262 monitor.	

VRE01 Service Guide

EK-VRE01-SG

Provides qualified service personnel with information to troubleshoot and repair the VRE01 monitor.

Ordering Information

You can order modems, supplies, and documentation by phone or by mail.

Continental USA and Puerto Rico

Call 800-258-1710 or mail to:

Digital Equipment Corporation
P.O. Box CS2008
Nashua, NH 03061

New Hampshire, Alaska, and Hawaii

Call 1-603-884-6660.

Outside the USA and Puerto Rico

Mail to:

Digital Equipment Corporation
Attn: Accessories and Supplies Business Manager
c/o Local Subsidiary or Digital-Approved Distributor

C

Communication

This appendix provides information on how the VT1000 communicates with a host computer, printer, or modem. The appendix describes

- Network communication protocols for LAT and TCP/IP connections
- Serial communication for text terminal windows, printers, and modems
- Signals carried by the serial communication and pointing device connectors on the back of the terminal.

The serial communication section shows the cables you can use for different system configurations.

Network Protocols

The VT1000 can use two network communication protocols, local area transport (LAT) and transmission control program/Internet protocol (TCP/IP). Each protocol connects the VT1000 to a host system through an Ethernet network.

LAT Functions

The LAT protocol connects the VT1000 terminal to VMS hosts in a local area network. The LAT protocol is Digital's own local area network protocol. The VT1000 complies with the architecture for LAT version 5.1 with extensions to define the characteristics of service classes 3 and 4.

The VT1000 supports LAT service classes 1, 3, and 4.

- **Service class 1** lets the VT1000 run video terminal window (VTE) applications through the LAT.
- **Service class 3** lets the VT1000 run X window and DECwindows applications through the LAT.

- **Service class 4** lets the VT1000 access font files through the LAT.

TCP/IP Functions

The TCP/IP protocol connects the VT1000 terminal to ULTRIX or UNIX hosts in a wide-area network. TCP/IP is an Internet wide-area protocol.

The VT1000 provides the following TCP/IP functions:

- Internet protocol (IP)
- Transmission control program (TCP)
- User datagram protocol (UDP)
- Boot protocol (BOOTP)
- Internet control message protocol (ICMP)
- Trivial file transfer protocol (TFTP)
- Address resolution protocol (ARP)
- Virtual terminal connection service (TELNET)
- Packet Internet groper (PING)
- An Internet demon to support character generation, echo services, and null device results.

Serial Communication

You can connect the VT1000 to a host or terminal server with a DEC-423 6-pin cable. The terminal has two serial communication ports, DEC-423 6-pin host port and a DEC-423 6-pin printer port. You can also use the printer port as a second host port, by changing settings in the Customize Printer Port dialog box (Chapter 5).

The terminal operates on full-duplex asynchronous lines only, with 10 possible transmit and receive speeds. You can use split transmit and receive speeds, but you must use the same speeds as your host system and printer. To match the speed of your host system or local printer, use the Customize Host Port or Customize Printer Port dialog box (Chapter 5).

Serial Communication Cables

You can connect the VT1000 directly to a local host system with a cable. You can also connect the terminal indirectly to a remote host system, using (1) a terminal server, or (2) a modem or acoustic coupler connected to public-switched or dedicated telephone lines. See "Modems" in Chapter 9.

You can connect the VT1000 to an asynchronous serial printer by using a null modem cable.

To order cables for connecting the VT1000 to a host system or printer, see Appendix B.

Serial XON/XOFF Flow Control

The VT1000 stores incoming characters in a character input buffer. The buffer can hold 254 characters. The terminal processes characters from the buffer on a first-in/first-out basis.

When the input buffer fills to 64 or 128 characters, the terminal sends an XOFF character to stop the host system from sending more characters. The default setting is 64. You can select from three settings—64, 128, or no XOFF—using the Customize Host Port or Customize Printer Port dialog box (Chapter 5).

NOTE

If you select No XOFF, the terminal does not send an XOFF character to the host system when the input buffer fills. Selecting No XOFF also disables the **F1 (Hold) key. With XOFF disabled, there is no way to ensure that data will not be lost.**

If the host system fails to respond to the XOFF character, the terminal sends a second XOFF character when the input buffer fills to 220 characters. The terminal sends a third XOFF character when the buffer is full.

When the input buffer falls below 32 characters, the terminal sends an XON character to tell the host system to start sending characters again.

If you enable XON/XOFF, the terminal recognizes received XON and XOFF characters. When the terminal receives XOFF, it stops sending data (except XON/XOFF characters). If the keyboard data buffer overflows, the keyboard locks. The terminal resumes transmission when it receives an XON.

Modem Connections and Disconnections

When the VT1000 makes a connection to a host system through a modem, the terminal performs the following operations to ensure it is ready to send and receive:

- Unlocks the keyboard (if it was locked).
- Clears any transmission in progress.
- Clears the keyboard buffer and all message buffers.
- Clears the input buffer.
- Clears XOFF sent and XOFF received.

Any of the following conditions will disconnect the connection to the host system:

- You type **[Shift] [F5]** (Break).
- You choose the Use Last Saved Settings or Use System Defaults menu items from the Customize menu.
- The terminal loses the data set ready (DSR) signal.
- The terminal receives a self-test command from the host system.

The usual way to disconnect communications is to type **[Shift] [F5]** (Break). The host system's response to the disconnect signal depends on the system and the software.

Break Function

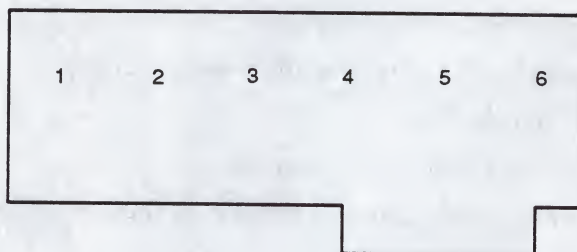
A break condition is the occurrence of a continuous space on a communication line for greater than one character time. If you are using a modem on a VMS operating system, this condition causes the modem to disconnect the terminal from the host system.

The **[F5]** (Break) key has three functions.

- If enabled, pressing **[F5]** (Break) sends a break signal to the host. If disabled, you can still send a break signal to the host by typing **[Shift] [F5]** (Break).
- Pressing **[Shift] [F5]** (Break) disconnects communications when you use a modem.
- Pressing **[Ctrl] [F5]** (Break) sends the answerback message to the host. You enter the message by using the Customize General dialog box (Chapter 6).

Communication Connector Signals

The VT1000 has one DEC-423 host system (communication) connector and one DEC-423 printer connector on the rear of the terminal. Table C-1 describes the signals for both 6-pin connectors. The following figure shows the pin numbers for the 6-pin connectors:



GSF_1383_89.DG

Table C-1 6-Pin DEC-423 Communication and Printer Interface Signals

Pin	Signal	Mnemonic	Description
1	Data terminal ready	DTR	<i>From VT1000</i> When on, tells the modem or printer that the VT1000 is ready to send or receive.
2	Transmit data	TXD+	<i>From VT1000</i> Sends serial characters. Held in the mark state (-) when characters are not being sent. In modem control modes, sends data only when DSR and DTR signals are on.
3	Transmit signal ground	TXD-	Provides the common ground reference potential for transmitted signals TXD+ and DTR.
4	Receive signal ground	RXD-	Provides the common ground reference potential for received signals RXD+ and DSR.
5	Receive data	RXD+	<i>To VT1000</i> Receives serial characters.

Table C-1 (Cont.) 6-Pin DEC-423 Communication and Printer Interface Signals

Pin	Signal	Mnemonic	Description
6	Data set ready	DSR	<p><i>To VT1000</i></p> <p>From the modem: When on, tells the VT1000 that it has a call connected.</p> <p>From the printer: When on, tells the VT1000 that the printer is ready to print. If DSR is present at power-up, the printer controls print operations. If DSR is not present at power-up, the terminal checks for DSR before each print operation.</p>

Pin Signals for the Pointing Device Connector

The VT1000 uses a 7-pin micro DIN connector for the pointing device. Table C-2 lists the connector pin assignments.

Table C-2 Pin Assignments for the Pointing Device Connector

Pin	Signal	Mnemonic
1	Protective ground	GND
2	Transmit data	TXD
3	Receive data	RXD
4	—	GND/-12
5	—	+5
6	not used	—
7	not used	—

Standards

The VT1000 operates in accordance with the following national and international communication standards:

EIA 232-D	CCITT V.10
CCITT V.24	ISO 2110.2
CCITT V.28	

D

Running a Remote X Window Session on a VMS System

This appendix describes how to use your VT1000 terminal to open an X window session on a host that is not in your local area (LAT) network. To do this, you need to route the session through another host on your local area network.

Using a few VMS DCL commands, you can run an X window or DECwindows session on a remote host.

Example

Suppose you want to run a remote X window session on a node called BETA. The node you normally use on your local area network is called ALPHA. To open the remote session, follow these steps:

1. Log in to ALPHA through a LAT terminal window (Chapter 3).
2. Edit the authorized node/user list file for your area. This file is called DECW\$USER_DEFAULTS:DECW\$DWT_DECNET_AUTHORIZE.DAT. You can edit this file using EDIT/EDT, the VMS default editor.

```
$ EDIT/EDT DECW$USER_DEFAULTS:DECW$DWT_DECNET_AUTHORIZE.DAT
```

The format of entries in the file are

Transport	Nodename	Username
-----------	----------	----------

For example, suppose your user name is Jones and you want to run a remote X windows session on node BETA. The transport you are using is DECnet. Add the following entry to the file:

```
DECNET    BETA    JONES
```

3. If you are already running an X window session on a local host, skip this step.

Specify your VT1000 as a display device for a DECnet object. You only have to perform this step if you are not already running an X window session on your terminal.

To specify your VT1000 as a display device for a DECnet object, enter the following DCL command at the \$ prompt:

```
$ SET DISPLAY/CREATE/TRANSPORT=LAT/NODE=Your_VT1000_LAT_Address
```

You can find the LAT node address of your terminal by looking at the VT1000 Terminal Manager window. For example, if your VT1000 LAT node address is LAT_08002B08E7EC, you would enter the the following DCL command:

```
$ SET DISPLAY/CREATE/TRANSPORT=LAT/NODE=L08002B08E7EC
```

4. Find your DECnet server number, by entering the following DCL command:

```
$ SPAWN/NOWAIT RUN SYS$SYSTEM:DECW$DWT_DECNET
```

A statement appears that indicates your DECnet server number. Let's suppose that the number is 10.

5. Connect to the remote host or cluster where you want to run X windows. In this example, the host is called BETA. Enter the following DCL SET HOST command:

```
$ SET HOST BETA
```

6. After you log in to BETA, you must specify the DECnet access option as the display. You must use your server number to do this. Remember, the server number for this example is 10. Enter the following DCL command:

```
$ SET DISPLAY/CREATE/TRANSPORT=DECNET/NODE=ALPHA/SERVER=10
```


7. You are now ready to run an X window application on the remote host BETA. Suppose you want to run the DECwindows clock application. Enter the following command:

```
$ RUN SYS$SYSTEM:DECW$CLOCK
```

E

System Manager Tasks

This appendix describes certain tasks a system manager must perform in the LAT and TCP/IP environments to prepare the system to support VT1000 terminals. The appendix is divided into two sections:

- LAT environment (VMS systems)
- TCP/IP environment (ULTRIX and UNIX systems)

Preparing the LAT Environment (VMS Systems)

Perform the following to prepare your LAT environment to support VT1000 terminals:

- Make sure your SYS\$MANAGER:SYSTARTUP_V5.COM file includes the following line:

```
$ @SYS$MANAGER:LTLOAD <various system-dependent parameters>
```

- To start VT1000 terminal support on your system, you need to add the following line to your SYSTARTUP_V5.COM file (or a root-specific startup file):

```
$ DEFINE/SYSTEM DECW$INSTALL_XTERMINAL TRUE
```

Your system is now ready to support the use of VT1000 terminals.

Preparing the TCP/IP Environment (ULTRIX and UNIX Systems)

Perform the following steps to prepare your TCP/IP environment to support VT1000 terminals:

- **Maintain the network address tables for the system.**
Each VT1000 terminal requires an IP address. Individual users can have the VT1000 request an IP address by clicking on the Determine IP Address button in the Customize TCP/IP dialog box. A supporting host must be able to resolve the IP address from the hardwired Ethernet address in the terminal.

You need to edit the BOOTP table file for IP address resolution. If you have not already created the file, you must create the file and call it `/usr/etc/bootptab`. This file lists each VT1000 IP address in the following format:

name 1 Ethernet_address IP_address default_file

<i>name</i>	Is the name used in the <code>/etc/hosts</code> file.
<i>1</i>	Signifies the base network as Ethernet.
<i>Ethernet_address</i>	Is the terminal's Ethernet address in hexadecimal format: <code>xx.xx.xx.xx.xx.xx</code> . The Ethernet address appears in the VT1000 Terminal Manager window.
<i>IP_address</i>	Is the terminal's IP address used in the file <code>/etc/hosts</code> . This address can use any valid IP address format.
<i>default_file</i>	Is the name of the file containing the font information for the terminal. For example: <code>/tftpboot/vt1000/font.paths</code> . The default file must be located on the same node as the one serving the BOOTP request.

↓ *here file is (not) not answerig*

Example of a /usr/etc/bootptab file

```
#
# home directory
/

# default bootfile
tftpboot/vt1000/font.paths

%%
# host htype haddr iaddr bootfile
vsg4          1 aa:00:04:00:38:de 128.45.74.53
dwtux1        1 08:00:2b:11:4d:28 128.45.74.81
dwtux11       1 08:00:2b:11:d2:b3 128.45.74.87
xds2          1 08:00:2b:11:24:74 128.45.74.81
```

- You may also have to edit the Internet daemon configuration file, /etc/inetd.conf. The following example shows a valid file:

/etc/inetd.conf (Internet daemon configuration file):

```
#
# @(#)inetd.conf      4.1.1.4      (ULTRIX)      4/19/88
# Internet server configuration database
#
#echo stream tcp nowait /etc/miscd echod
#echo dgram udp wait /etc/miscd echod
#discard stream tcp nowait /etc/miscd sinkd
#discard dgram udp wait /etc/miscd sinkd
systat stream tcp nowait /etc/miscd systatd
#systat dgram udp wait /etc/miscd systatd
daytime stream tcp nowait /etc/miscd daytimed
#daytime dgram udp wait /etc/miscd daytimed
quote stream tcp nowait /etc/miscd quoted
#quote dgram udp wait /etc/miscd quoted
#chargen stream tcp nowait /etc/miscd chargend
#chargen dgram udp wait /etc/miscd chargend
ftp stream tcp nowait /usr/etc/ftpd ftpd
finger stream tcp nowait /usr/etc/fingerd fingerd
telnet stream tcp nowait /etc/telnetd telnetd
#time stream tcp nowait /etc/miscd timed
time dgram udp wait /etc/miscd timed
tftp dgram udp nowait /usr/etc/tftpd tftpd -r /tftpboot #<--- needed
exec stream tcp nowait /etc/rexecd rexecd # for
login stream tcp nowait /etc/rlogind rlogind # fonts
shell stream tcp nowait /etc/rshd rshd
comsat dgram udp wait /etc/comsat comsat
talk dgram udp wait /etc/talkd talkd
ntalk dgram udp wait /usr/etc/ntalkd ntalkd
bootp dgram udp wait /usr/etc/bootpd bootpd -i # <--- needed
# to
# determine
# IP address
```

?

- **Create a font path definition file.**

The VT1000 accesses fonts using TFTP. VT1000 users need to specify a font path. You need to create a file that specifies the location of each available font. This file must have world read access.

To create a font path file, issue the following commands on the host:

For UWS version 2.1

```
$ /bin/sh
$ cd /
$ mkdir tftpboot
$ cd tftpboot
$ mkdir vt1000
$ cd /usr/lib/dwf
$ find 75dpi -print | cpio -pcvd /tftpboot/vt1000 # for 75dpi fonts
$ find 100dpi -print | cpio -pcvd /tftpboot/vt1000 # for 100dpi fonts
$ cd /tftpboot/vt1000
$ d=/tftpboot/vt1000/
$ for i in *[0-9]*
> do
> find $i/* -name "*.dwf" -print
> done | sed "s?^?$d?" > font.paths
$ find * -type f -print | xargs chmod 444
```

For UWS version 2.2

```
$ /bin/sh
$ cd /
$ mkdir tftpboot
$ cd tftpboot
$ mkdir vt1000
$ cd /usr/lib/X11/fonts/decwin
$ find 75dpi -print | cpio -pcvd /tftpboot/vt1000 # for 75dpi fonts
$ find 100dpi -print | cpio -pcvd /tftpboot/vt1000 # for 100dpi fonts
$ cd /tftpboot/vt1000
$ d=/tftpboot/vt1000/
$ for i in *[0-9]*
> do
> find $i/* -name "*.pcf" -print
> done | sed "s?^?$d?" > font.paths
$ find * -type f -print | xargs chmod 444
```

For UWS version 2.2 RISC

The VT1000 can use the same font files as VAX VMS DECwindows Version 2.0, VAX UWS version 2.1, or VAX UWS version 2.2. However if your font host is a RISC UWS version 2.2 system or one of the many other UNIX-based systems whose X font file formats are incompatible with the VT1000, you need to install a tape with VAX UWS compatible fonts.

For UWS 2.2 RISC, first install the tape then perform the following steps:

*working
in .doc. update*

```
$ cd /tftpboot/vt1000
$ d=/tftpboot/vt1000
$ for i in *[0-9]*
$ do
$ find $i/* -name "*pcf" -print
$ done | sed s?^?$d? > font.paths
```


F

Keyboard Models

This appendix shows each standard model of the VT1000 keyboard. Many models are available in two versions, standard and word processing. The key positions on both versions are the same. However, the word processing version has different labels on some keys, for word processing functions.

LK401 Keyboard Models

North American/United Kingdom)

Belgium (Flemish)

Canada (English)

Canada (French)

Denmark

Finland

France/Belgium

Germany/Austria

Holland

Italy

Norway

Portugal

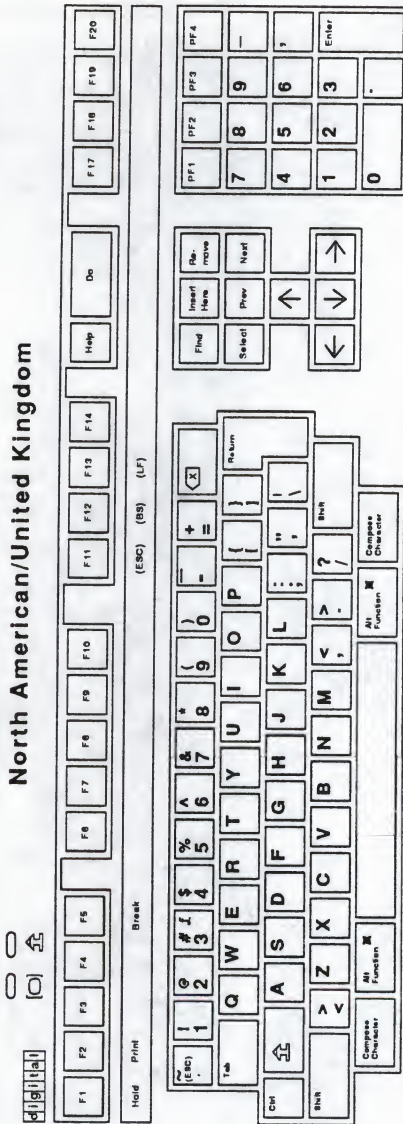
Spain

Sweden

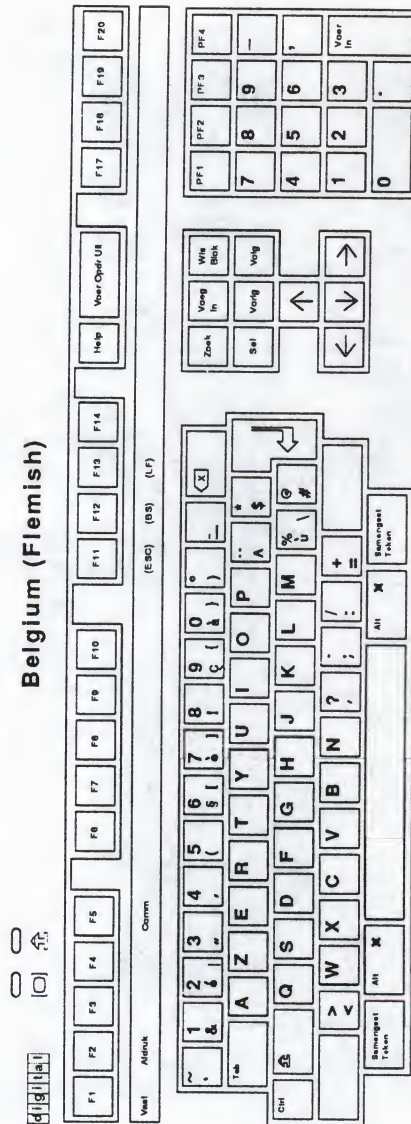
Switzerland (French)

Switzerland (German)

North American/United Kingdom

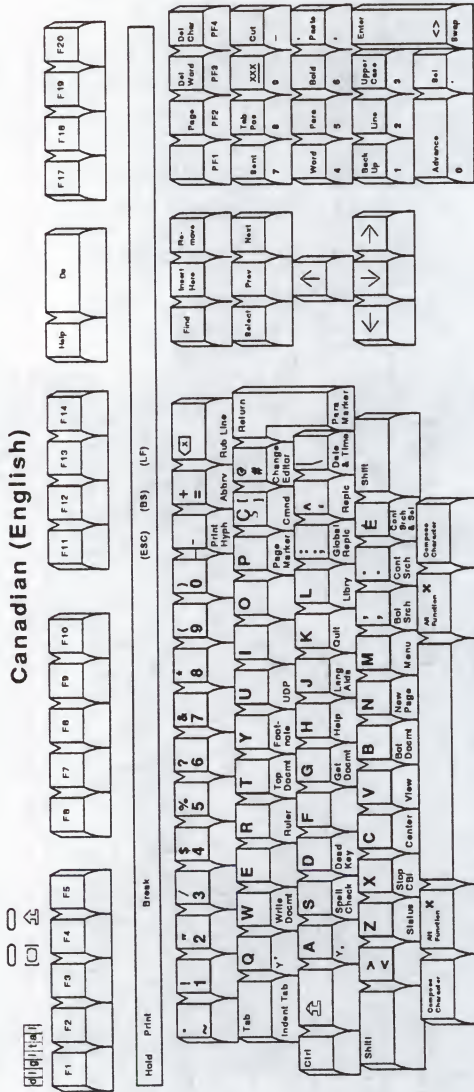


Belgium (Flemish)

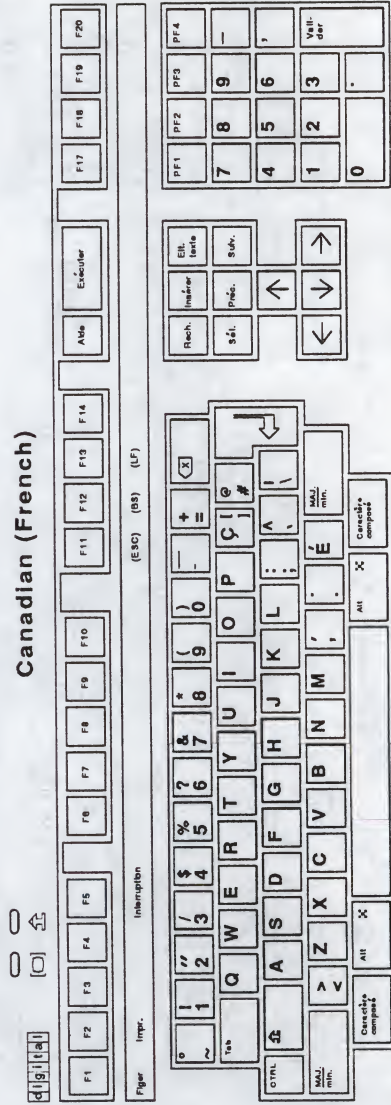


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Canadian (English)

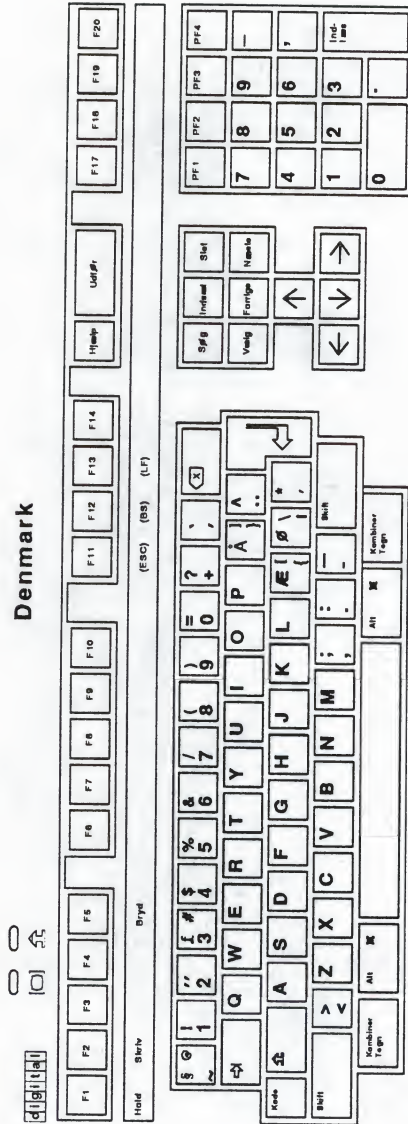


Canadian (French)

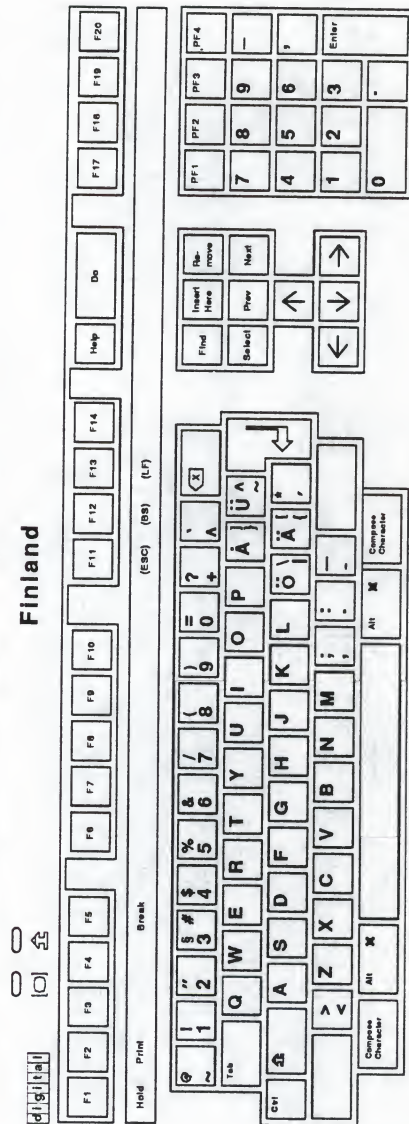


GSF_1338_89_R.DG

Denmark

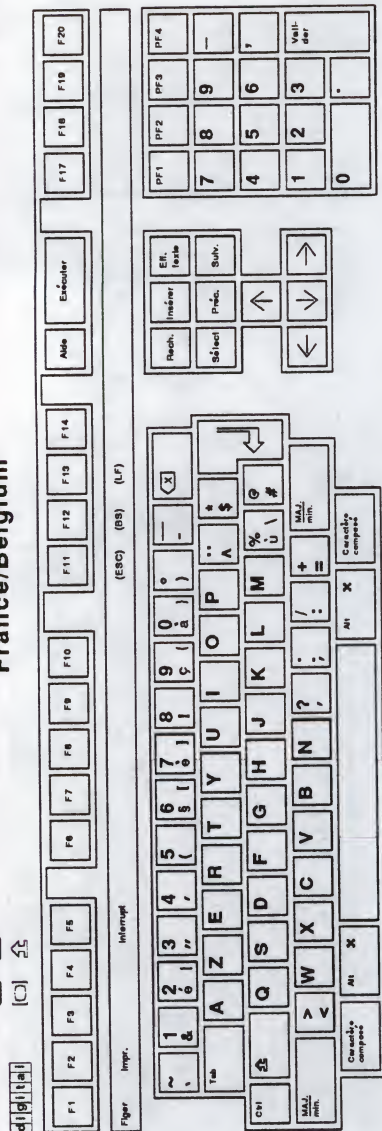


Finland

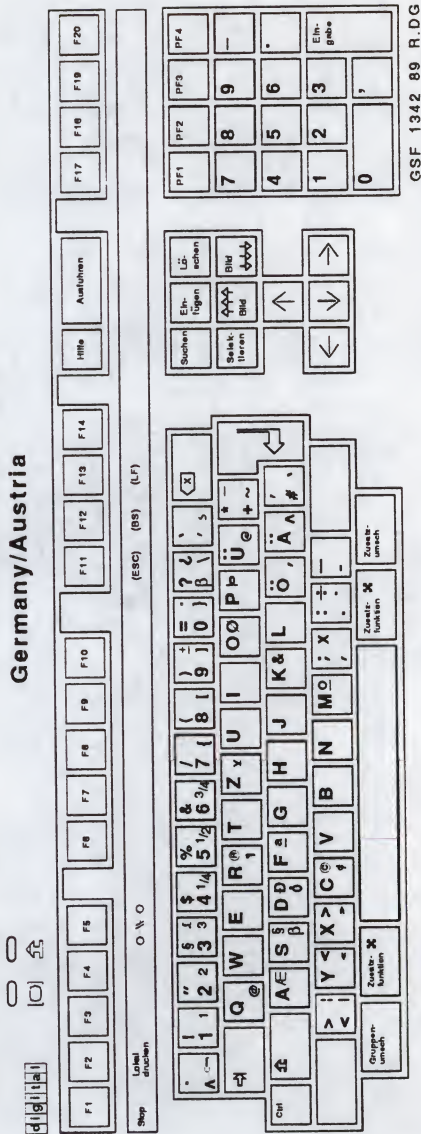


GSF_1340_89_R.DG

France/Belgium

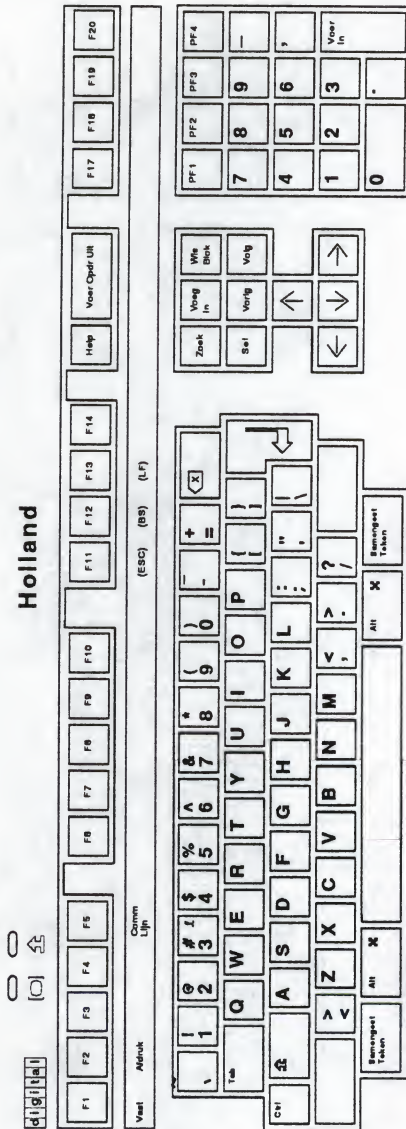


Germany/Austria

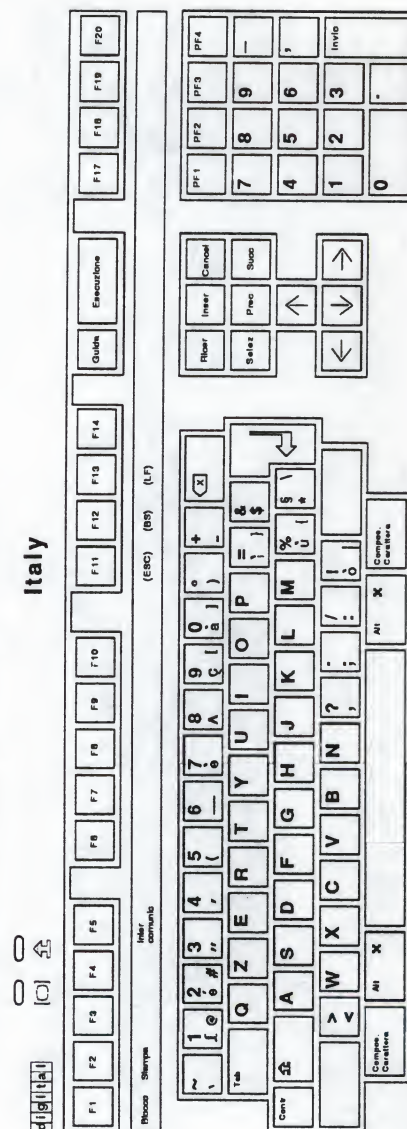


GSF_1342_89_R.DG

Holland

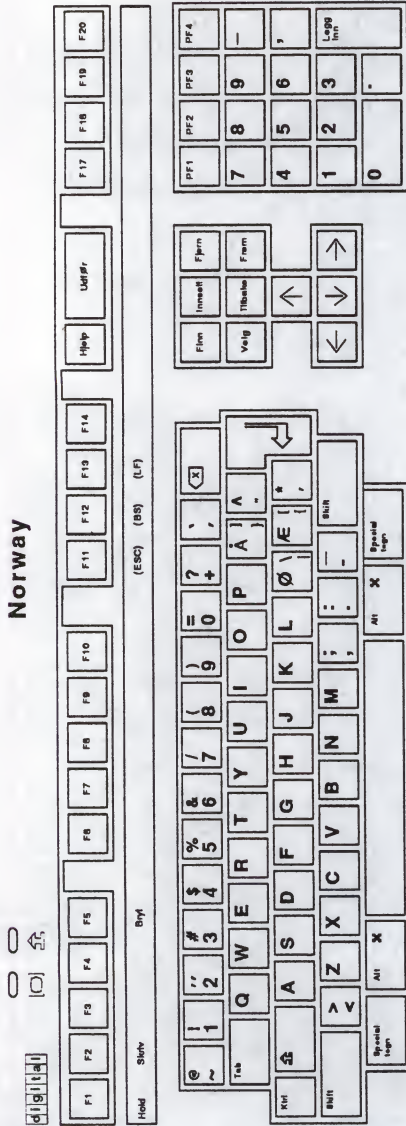


Italy

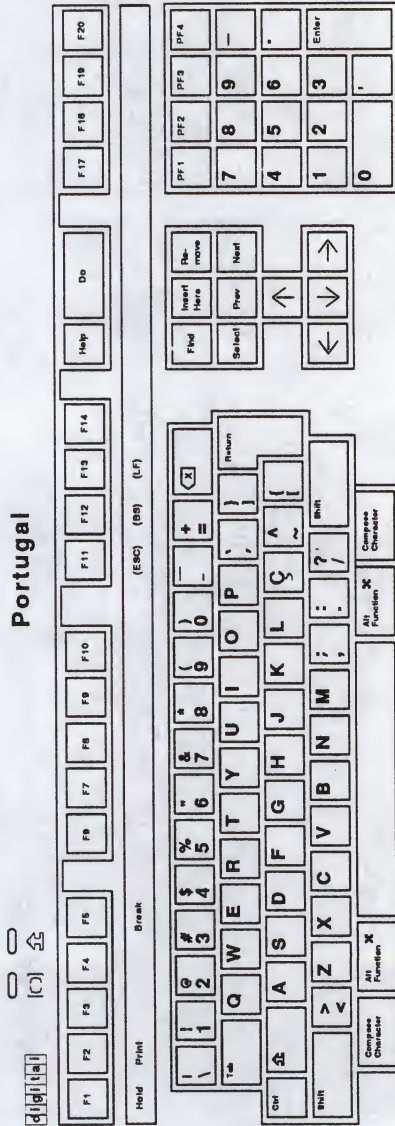


GSF_1344_89_R.DG

Norway

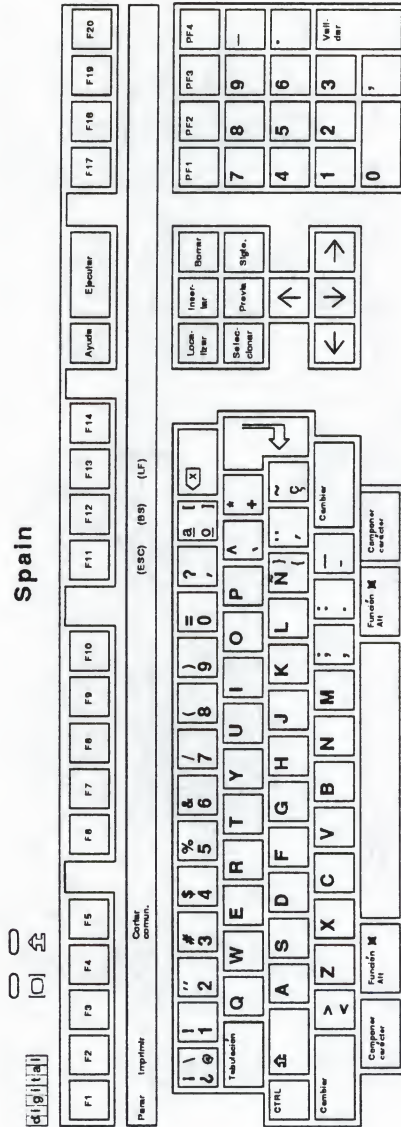


Portugal

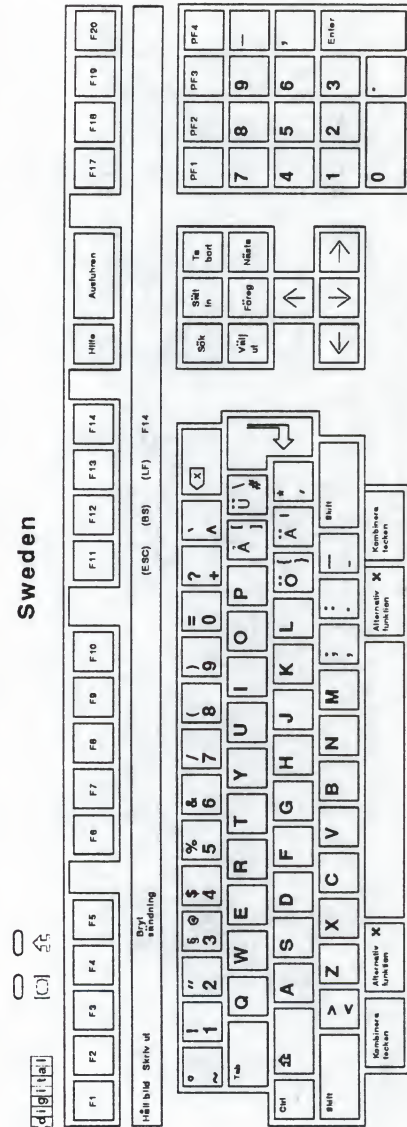


GSF_1346_89_R.DG

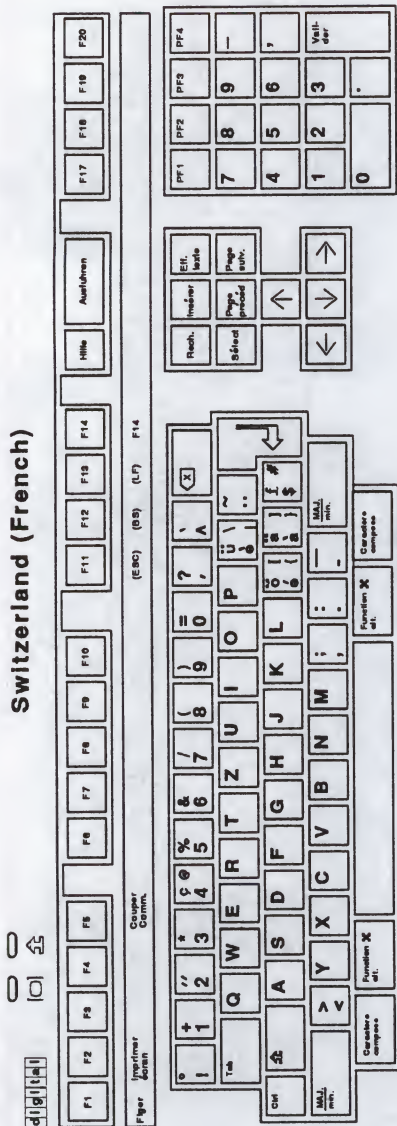
Spain



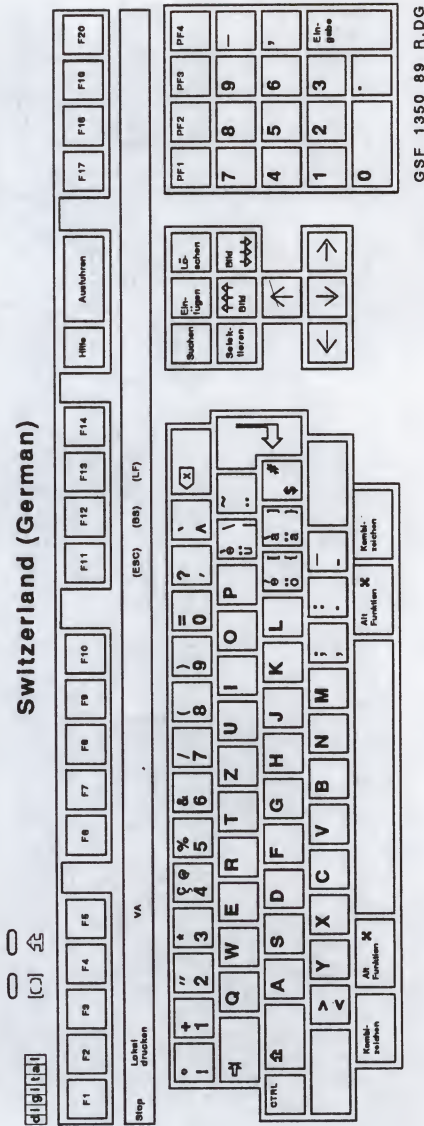
Sweden



Switzerland (French)



Switzerland (German)



GSF_1350_89_R.DG

Glossary

ANSI

American National Standards Institute

ASCII

American Standard Code for Information Interchange. A set of 7- or 8-bit binary numbers representing the alphabet, punctuation, numerals, and other special symbols used in text representation and communications protocol.

Application

A program that performs a specific task.

CCITT

Comite Consultatif International de Telegraphique et Telephonique (International Telegraph and Telephone Consultative Committee). A standards committee for the communication industry in Europe.

Character set

A group of graphic characters and control characters stored as a unit in the terminal. Graphic characters are characters you can display on the screen. Control characters perform special functions.

Compose character

A character produced by pressing two or three keys in sequence, starting with the Compose Character key or a diacritical mark key. You can use compose sequences to produce characters that do not appear as standard keys on your keyboard.

Computer system

A combination of system hardware, software, and external devices that performs operations and tasks.

Cursor

A blinking line or block on the screen that indicates the active position.

DEC Multinational character set

The default character set for the VT1000 terminal. The DEC Multinational set is one of two 8-bit sets built into the VT1000. The other set is ISO Latin-1. Both 8-bit sets include the standard ASCII character set and a supplemental set. For 7-bit environments, see *National replacement character sets*.

Data processing keys

Keys that have three or four characters on the top of their keycap. The characters on the right half of the keycap are data processing characters. To use data processing characters, you must select the data processing version of your keyboard in the Customize Keyboard dialog box.

DECconnect

Digital's cabling system for extending Ethernet and terminal interconnections into offices and work areas.

DECnet

Digital's networking software that runs on nodes in both local and wide area networks.

Default option

A push button with a double outline, indicating the most frequently used setting for a window. You can choose a default option by pressing Return or clicking on the push button.

Default setting

A standard setting for one of the terminal's operating features, set at the factory. The VT1000 uses factory-default settings, unless you select a new setting.

Device icon

An icon on the back of the system box that identifies the device that can be plugged into the connector.

Diacritical marks

Marks or symbols that indicate a change in the standard pronunciation of a letter. Examples of diacritics are acute accent ('), grave accent (`), and tilde (~). On the VT1000, you can use diacritical marks (if available on your keyboard) to start two-stroke compose sequences.

Ethernet

A type of local area network, based on Carrier Sense Multiple Access with Collision Detection (CSMA/CD). A communication concept for local communication networks that use coaxial cable.

Filter rectangle

A bounded area used defined on the screen. To activate the filter, you define its coordinates with a control function. If the terminal detects that the locator is outside the filter rectangle, the terminal sends an outside rectangle event and disables the rectangle.

Font path

A logical file that lets a device access alternate character fonts for certain X window applications.

Full-duplex modem

A *modem* that can handle simultaneous, two-way communications.

Graphics

The use of lines, figures, shapes, and shaded areas to display information.

Graphics tablet

An optional device used to move the graphics input cursor on the screen and to enter data to an application program. Most tablets have three parts: a tablet, stylus, and puck. To move the cursor you move the puck or stylus across the tablet. Also known as a *locator device*.

Group code

A number that represents a host or group of hosts on a *LAT* network.

Hardware

The physical equipment—mechanical and electrical—that make up a system. Compare to software.

Hardware Ethernet address

The unique Ethernet physical address associated with a particular Ethernet communications controller.

Host system

A computer system that has an active connection to your terminal. The primary or controlling computer in a multiple-computer network.

Icon

A graphic representation of an object, application, process, or window.

Internet

A collection of networks that includes the ARPAnet, a number of local networks at universities and research institutions, and many military networks. See *TCP/IP*.

IP address

A network address that identifies the location of a device on the TCP/IP network.

ISO

International Standards Organization. ISO Latin-1 is one of the two 8-bit multinational character sets built into the VT1000. The other set is the *DEC Multinational* set. For 7-bit environments, see *National replacement character sets*.

Kilobyte (KB)

When referring to memory, 1024 bytes.

LAT

Local area transport. A network protocol created by Digital for local area network communication.

LAT address

A network address that identifies the location of a device on the LAT network.

LED

Light-emitting diode. LEDs are used as indicators on the keyboard.

Local area network (LAN)

A high-speed communications network that covers a limited geographical area, such as a section of a building, an entire building, or a cluster of buildings.

Locator device

See *pointing device*.

Megabyte (MB)

When referring to memory, 1000 kilobytes or 1,048,576 bytes.

Modem

Modulator - demodulator. A device that converts data from a computer or terminal into signals that can be sent over a telephone line and back again.

Modifier key

A key pressed in combination with another key, to modify the code sent by that key. **Ctrl** is a modifier key.

Monochrome monitor

A video screen that displays images in shades of one color.

Mouse

A handheld pointing device used to select menu options and draw graphics. Moving the mouse across the desktop moves the pointer or mouse cursor on the screen. The mouse has three buttons that serve as function keys.

National replacement character sets (NRCs)

Seven-bit character sets for many Western European languages. Each set has 94 characters. NRC sets are similar to the ASCII set, except for a few characters.

Network

Two or more computers linked by communication lines to share information and resources.

Network coordinator

The person who manages the network, assigns unique node names and addresses for each VT1000 on the network, and provides administrative assistance to network users.

Node

A computer, workstation, or peripheral device that is connected to a network and can communicate with other members of the network.

Nonvolatile memory

Random access memory (RAM) that does not lose its contents when you turn the terminal off. The VT1000 uses this memory to store *factory-default* settings and your own saved settings.

Pixel

Picture elements. The smallest displayable unit on a video screen. To display a character, the terminal turns on a series of pixels.

Pointing device

A mouse or a graphics tablet, used with X window applications and menus to move the cursor on the screen. Also called a locator device.

Port

A means for connecting one device to another. Usually, each port has an associated connector.

Prefix key

A key that you press and release before pressing another key, to change the function of one or more keystrokes. Compose Character is a prefix key.

Random access memory (RAM)

Memory that can be read from and written to. The VT1000 uses this memory to store instructions of programs currently being run.

Read-only memory (ROM)

Memory that can be read from, but not modified. The VT1000 uses ROM memory to store its operating code.

Scroll bar

A vertical or horizontal bar that lets you scroll information in the associated window. The scroll bar includes *stepping arrows* and a *slider* that let you move at various rates.

Scrolling

Moving information on the screen upward or downward to display more data.

Server

Hardware or software that provides a specific set of services to a client.

Service

A name that represents a host or cluster of hosts that provides access to that host or cluster.

Sixel

A vertical column of six *pixels*. Screen displays can be printed in the form of sixel graphics.

Slider

Part of a *scroll bar* that lets you scroll through information in a window. The size of the slider indicates how much of a file is currently displayed. The smaller the slider, the larger the file. The location of the slider in the scroll region indicates your relative position in the file.

Software

Programs that perform a chosen or required function. Compare to hardware.

Stepping arrow

Part of a scroll bar that lets you move incrementally through information in a window.

System

A combination of hardware, software, and peripheral devices that perform specific processing operations.

System manager

A person who performs tasks necessary to operate and maintain the system. See *Network coordinator*.

TCP/IP

Transmission control program/Internet protocol. The standard wide area networking software for the ULTRIX and UNIX operating systems. TCP/IP is a set of protocols developed by researchers centered around the Advanced Research Projects Administration Network (ARPAnet).

Terminal server

An intelligent unit that can connect a number of asynchronous devices (terminals and printers) to a host system. For example, Digital's DECserver 200 can link eight VT1000 terminals to a system in a local area network (LAN), using a high-speed Ethernet cable.

Terminator

A connector used on one or both ends of an Ethernet segment that provides the 50-ohm termination resistance needed for the cable.

ThinWire Ethernet network

A term to describe Digital's 10base2 (IEEE standard 802.3 compliant) Ethernet products used for local distribution of data.

Transition

The pressing or releasing of a locator button. The terminal can report transitions to the host system, using locator reports.

ULTRIX

A UNIX based operating system created by Digital.

UNIX

An operating system created by AT&T.

User-defined keys (UDKs)

Any of the 15 keys (F6 through F20) on the top row of the keyboard a user can define to perform specific functions.

Visual character attribute

A quality of a display character that highlights the character, such as bolding and underlining.

VMS

Digital's proprietary operating system.

Window

An area on your monitor screen that represents all or part of an application.

Window system

A windowing architecture that allows the execution and display of applications to be independent. Specific components of the architecture control the display of applications and determine how applications run. Since its introduction by MIT, the X Window System has become an industry standard.

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